DENTISTRY
LIBRARY

PROPERTY OF
DENTAL LIBRARY
UNIVERSITY OF MICHIGAN
DON'T MUTILATE OR
REMOVE

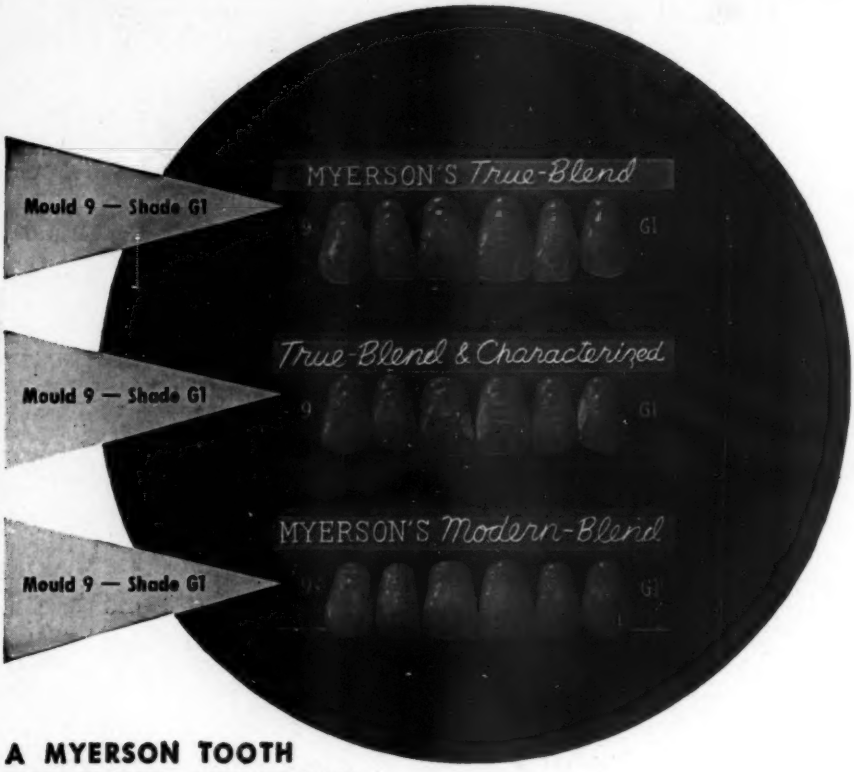
THE Journal OF THE
AMERICAN DENTAL ASSOCIATION

OCTOBER 1, 1947 • VOLUME 35 • NUMBER 7

# CONTENTS

Recent Trends in Use of Sulfonamides.....Ostrander....461
Gingival Disease in Postwar Italy. I.....Schour....475
Root Canal Treatment.....Weaver....483
Tooth Structure and Caries Immunity.....Yardeni....498
Editorials.....503
International Correspondence.....506
News of Dentistry.....508
Council on Dental Therapeutics.....522
Committee on Dental Economics.....525
Research Commission.....526
Book Reviews.....527
Current Literature.....528
Army Dental Corps Separations.....536
Navy Dental Corps Separations.....538
Deaths.....539
Directory.....540
Announcements.....542

# a new system of tooth selection




## A MYERSON TOOTH FOR EVERY AGE GROUP

***True-Blend*** **— for the forty-plus patients who desire natural-looking restorations and often, too, for younger more rugged-looking patients.**

***Characterized*** **— strongly indicated for those who have recently had a number of fillings in their anterior teeth.**

***Modern-Blend*** **— for younger patients and female patients whose natural teeth have not been made rugged and stained by wear or aging, and the many who wish to add youthfulness to their appearance.**

**Remember, only with this simple, scientific system can you select a mould and shade for your patient and have that mould and shade in any one of these three lines, individualized according to your patient's requirements.**

**Send for 20 page booklet describing this newest Myerson development.**

**MYERSON TOOTH CORPORATION • CAMBRIDGE 39, MASS.**

***Formerly Ideal Tooth Incorporated***



The Journal of the American Dental Association, Vol. 35, No. 7. Published by the American Dental Association, 222 E. Superior St., Chicago 11, Ill. Yearly subscription $7.00 for U. S. and possessions; $8.00 for foreign countries. Single copy forty cents. Entered as second-class matter, May 27, 1942, at the postoffice at Chicago, Ill., under the act of August 24, 1912. Published semimonthly. Copyright 1947 by the American Dental Association. The Journal of the American Dental Association is indexed in the Index to Dental Literature and, in part, in the Quarterly Cumulative Index Medicus, Biological Abstracts and Chemical Abstracts.

THE Journal OF THE AMERICAN DENTAL ASSOCIATION

OCTOBER 1, 1947 • VOLUME 35 • NUMBER 7

# RECENT TRENDS IN USE OF SULFONAMIDES

F. D. Ostrander,* D.D.S., M.S., and D. A. Kerr,† D.D.S., M.S., Ann Arbor

A DECADE has passed since the sulfonamides were first introduced into general use in medicine and some eight years have elapsed since the first paper on the local uses of the sulfonamides in dentistry was published by Sinclair.[1] During this period many critical research projects have been reported, making it possible to view the problems of sulfonamide therapy in a much clearer perspective than in the early years of their therapeutic use. Many of these papers have been reviewed in previous publications of the Council on Dental Therapeutics,[2-4] but recent developments have more sharply defined the values, limitations and dangers of this group of drugs, making another review in order at this time.

It is now abundantly evident to all who have studied them that the sulfonamides are potentially dangerous when used carelessly, either internally or topically. So much has been written about the systemic toxicity of this group of drugs that it seems unnecessary to review this phase in detail here. No physician or dentist should attempt to administer these drugs internally without being thoroughly familiar with the serious complications which may result from sulfonamide therapy. Some of the more severe complications include hepatitis and jaundice, acute hemolytic anemia, leukopenia, granulocytopenia and severe renal damage with possible hematuria and anuria.

These toxic effects, as well as those of a less serious nature, vary greatly in frequency and intensity in different persons and among different members of the sulfonamide group. Details of the systemic toxicity may be obtained by consulting Accepted Dental Remedies[5] or

This paper has been authorized for publication by the Council on Dental Therapeutics. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the Council.

*Associate professor of dentistry, University of Michigan.

†Assistant professor of dentistry, University of Michigan.

1. Sinclair, J. A., A Preliminary Report on the Local Use of Sulfanilamide in the Treatment of Oral Lesions. *J. Canad. D. A.* 3:571 (November) 1937.

2. Kanthak, F. P., and Pickering, P. P., Sulfanilamide: A Review of the Clinical and Experimental Work on Its Therapeutic Properties. *J.A.D.A.* 25:1474 (September) 1938.

3. Council on Dental Therapeutics, Sulfanilamide. *J.A.D.A.* 26:987 (June) 1939.

4. Ostrander, F. D., and Hartmann, F. W., Local Use of Sulfonamides. *J.A.D.A.* 29:1031 (June) 1942.

5. Accepted Dental Remedies, 13th Ed. Chicago: American Dental Association, 1947, p. 123.

New and Nonofficial Remedies.[6] Because of the serious nature of sulfonamide toxicity and the necessity for frequent laboratory tests (urinalysis, blood level determinations and blood counts) when these drugs are used systemically for any length of time, in most instances in general dentistry such medication should be carried out in cooperation with the patient's physician.

### Sensitization

In addition to the direct systemic toxic effects, it has been shown in the past few years that the sulfonamides have the property of producing sensitivity and sensitization reactions in some persons to whom they are administered. Any given patient may tolerate an initial course of sulfonamide therapy with little or no reaction to the drug, but when the drug is administered again the same person may show a serious toxic reaction. Although not all authorities agree on the nature of these reactions, it is probable that it is a type of allergic reaction produced by an acquired hypersensitivity which may develop from the absorption of even small amounts of the drug.[7] Black-Schaffer[8] describes 5 cases of apparent anaphylactic death after therapeutic use of the sulfonamides. In all of these cases, sulfanilamide, sulfathiazole or sulfadiazine, or combinations of them, had been given systemically for several days preceding the onset of serious clinical symptoms. Black-Schaffer describes the postmortem lesions in these cases as identical with those produced in a few human subjects and many animials by known species-foreign proteins. He further states that the knowledge that the sulfonamide compounds may convert homologous proteins into allergens and the fact that characteristic clinical syndromes follow the administration of the drugs constitute sufficient evidence to justify the concept of the anaphylactic nature of the lesions.

Whatever the nature of the reaction may be, it should be emphasized that absorption from local application, as well as absorption from the intestinal tract or from parenteral injection of the compounds, may cause sensitization. Although it is difficult to estimate the incidence of sensitization, all investigators agree that it is far from negligible. Bloom estimates that a third of those receiving sulfonamide therapy become sensitized.[9] Lyons and Balberor observed "drug fever reactions" in 36 per cent of cases on readministration of sulfathiazole.[10] Dowling and Lepper noted febrile reactions on readministration of sulfathiazole in 16 per cent of cases, sulfapyridine in 9 per cent and sulfadiazine in 7.4 per cent.[11] Most authorities agree that sulfathiazole is the drug most liable to produce sensitization, but none of the sulfonamides is free from this undesirable characteristic.

Perhaps the most serious consideration of the sensitization problem is the patient who becomes sensitized from treatment with a sulfonamide for some minor ailment and then is unable to tolerate the drug when a dangerous illness arises. Schwartz[12] has reported the case of a man who used sulfonamide nose drops. He later contracted pneumonia and received sulfonamide therapy. A severe exfoliative dermatitis and anuria developed with death resulting. In fact, so many such cases have been reported that the Section on Dermatology of the Amer-

6. New and Nonofficial Remedies. Chicago: American Medical Association, 1946, p. 177.

7. Bloom, David, Danger of Cutaneous Reactions to Sulfonamides; Report of Two Cases of Bullous Eruptions Following Use of Sulfanilamide, One of Which Resembled Pemphigus Vulgaris. *N. Y. State M. J.* 43:1499 (August 15) 1943.

8. Black-Schaffer, B., Pathology of Anaphylaxis Due to Sulfonamide Drugs. *Arch. Path.* 39:301 (May) 1945.

9. Bloom, David, Misuse of Sulfonamide Compounds. *Arch Dermat & Syph.* 49:249 (April) 1944.

10. Lyons, R. H., and Balberor, H., Febrile Reactions Accompanying Readministration of Sulfathiazole. *J.A.M.A.* 118:955 (March 21) 1942.

11. Dowling, H. F., and Lepper, M. H., "Drug Fever" Accompanying Second Courses of Sulfathiazole, Sulfathiazine and Sulfapyridine. *Am. J. M. Sc.* 207: 349 (March) 1944.

12. Council on Pharmacy and Chemistry, Dangers From External Use of Sulfonamides. *J.A.M.A.* 128: 1024 (August 4) 1945.

ican Medical Association considered the problem serious enough to pass a resolution deploring the indiscriminate sale and use of the sulfonamide drugs, and in March 1945 the Committee on Public Health Relations of the New York Academy of Medicine recommended that the city of New York bar all drugs containing sulfonamides from over-the-counter sale without exception.[15]

Fortunately there have been only a few instances of sensitization reported from topical use of the sulfonamides in dentistry. It is possible that this is true because the conditions under which they are used in dentistry do not favor absorption of any great amount of sulfonamide. The areas treated are usually small as compared with those encountered in general surgery or in dermatology. Furthermore the areas are often surrounded with bone where absorption would be at a minimum, and treatment is rarely prolonged more than a few days, often being limited to a single application. Many instances of sensitization have occurred from the use of the sulfonamides in the treatment of skin infections. For this purpose the drugs are usually incorporated into an ointment base, and the Council on Pharmacy and Chemistry has warned against the use of such preparations for a period of more than five days because of the danger of sensitization.[6]

Another reason for avoiding the indiscriminate use of the sulfonamides is the fact that some organisms tend to become sulfonamide-fast when exposed to these drugs. Perhaps the best example is the gonococcus. When sulfathiazole was first introduced a high percentage of gonorrhea cases yielded readily to its use, but now many cases of sulfonamide-resistant gonorrhea are seen. Thus extensive use of these drugs for minor ailments may tend to build up strains of sulfonamide-resistant organisms.

13. Lane, C. W., Observations on Topical Application of Sulfonamides. *South, M. J.* 38:125 (February) 1945.

## Foreign Body Reactions

When sulfonamides first were used locally, it was assumed that they would produce no harmful effects when applied to wounds, abrasions or accessible infections. This assumption soon was shown to be false, and it is now well established that topical application of sulfonamides may produce a foreign body reaction and delay healing in wounds, and that serious toxic effects and sensitization reactions may be produced from any extensive topical use.

Numerous research men and clinicians have reported on the irritating effects of sulfonamides.[14-16] Krashen[17,18] early observed that not all sockets seemed affected beneficially by the application of sulfonamides and concluded that large quantities of these drugs are not indicated in a wound. More recently the Council on Pharmacy and Chemistry of the American Medical Association has warned that sulfathiazole may cake or crust in wounds and thus act as a foreign body and has suggested that a sulfonamide should be used not to exceed 0.1 gm. (1.5 grains) per square inch of wound surface.[6]

## Histologic Study

In order to determine histologically what happens when sulfonamides are used in sockets or bone cavities such as those produced in alveolectomies we have carried out a study of the mouths of dogs. After extraction of dogs' teeth, the sockets were medicated with various dosages and dosage forms of sulfonamides. In some of the dogs bone cavities

14. Glynn, L. E., Effects of Sulphanilamide, Sulphathiazole and Sulphapyridine on Development of Granulation Tissue and Their Toxic Action on Striped Muscle. *J. Path. & Bact.* 53:183 (September) 1941.

15. Bick, E. M. Observations on Topical Use of Sulfonamide Derivations. *J.A.M.A.* 118:511 (February 14) 1942.

16. Taylor, F. W., Misuse of Sulfonamide Compounds. *J.A.M.A.* 118:959 (March 21) 1942.

17. Krashen, A. S., A Preliminary Report on the Sulfanilamide in the Average Extraction Case. *J.A.D.A.* 27:1109 (August) 1940.

18. Krashen, A. S., Local Use of Sulfonamides, *J.A.D.A.* 29:1427 (August 1) 1942.

similar to alveolectomy cavities were prepared and the sulfonamides were sutured into the region. The dogs were allowed to live for periods varying from three to thirty days. They were then killed, and sections of the medicated areas and controls were prepared for microscopic study.

Since sulfathiazole and sulfanilamide are the most widely used of the sulfonamides for topical application, they were chosen for this study. The methods used for applying these drugs in the dogs were similar to those most widely used in clinical dentistry; that is, the packing of the socket with some form of commercial or extemporaneously prepared ointment and the packing or dusting of a socket with some form of dry sulfonamide. In this study the ointments used were an extemporaneously prepared paste of sulfathiazole or sulfanilamide and eugenol and a commercial sulfathiazole and glycerin ointment of the following formula:

| | |
|---|---|
| Sulfathiazole | 60.0 per cent |
| Acacia powder | 6.0 per cent |
| Glycerin | 30.977 per cent |
| Benzyl alcohol | 3.0 per cent |
| Metaphen | 0.023 per cent |

The dry sulfonamides or ointments were packed solidly into certain sockets, and other sockets were sponged and then dusted lightly with the sulfonamide powder, after which a sponge was held over the socket under pressure until a clot was formed. The results obtained are summarized in the table.

**Results of observations on the use of sulfonamides in experiments with dogs**

| Dog No. 1—Three days | |
|---|---|
| Medication in socket | Result |
| Sulfathiazole powder packed in socket | No evidence of crystals in exudate and clot filling socket. Early organization of clot around periphery. Increased wandering cells. Partial regeneration of surface epithelium. |
| Socket dusted with sulfathiazole powder | No crystals seen. Normal early organization of clot. Partial regeneration of epithelium. |
| Socket washed with 1 per cent suspension of sulfathiazole in physiologic salt solution | No crystals seen. Early peripheral organization. Partial epithelial regeneration. |
| Socket packed with sulfathiazole and eugenol paste | Socket is partially filled with crystalline material. Early organization at base of socket. Purulent exudate in orifice of socket. Unorganized clot in proximity to foreign material. No proliferative action in periodontal membrane in contact with foreign material. Some evidence that this is partially due to concentration of eugenol at surface of pack. |
| Socket packed with sulfathiazole and eugenol paste (root fragment present) | Foreign crystalline material present. Almost complete lack of organization. Purulent exudate around foreign material. |
| Control No. 1: No medication | Marked early organization of blood clot. Fragments of cementum in blood clot. Very few wandering cells. Partial regeneration of surface epithelium. Slight area of bone resorption but not sufficient to be considered significant. |
| Control No. 2: No medication | Early organization of clot. Partial regeneration of epithelium. |
| Control No. 3: No medication | Early organization of clot. Partial regeneration of epithelium. |

| | |
|---|---|
| Control No. 4: No medication | Small amount of foreign material present. Early organization of clot and partial regeneration of epithelium. |
| Control No. 5: No medication | Few foreign particles present in clot. Early and extensive organization. Partial epithelial regeneration with surface opening of socket almost closed. Small amount of purulent exudate near orifice. |

Dog No. 2—Three days

| Medication in socket | Result |
|---|---|
| Packed with sulfathiazole and eugenol (root tip present) | Socket partially filled with crystalline material. Minimal evidence of organization. |
| Dusted with sulfathiazole powder | No evidence of crystalline material present. Minimal evidence of organization and slight purulent exudate. Slight epithelial regeneration. Foreign vegetable material present. |
| Packed with commercial paste of sulfathiazole and glycerin | No evidence of sulfathiazole crystals. Some foreign vegetable material present. Minimal organization of clot with partial epithelial regeneration. Some purulent exudate. |
| Packed with commercial paste of sulfathiazole and glycerin | Foreign vegetable material in blood clot. Numerous inflammatory cells. Little proliferation in area of periodontal membrane. Minimal organization and no evidence of epithelial regeneration. |
| Control—No medication | Foreign vegetable material present and evidence of extensive trauma in extraction. Minimal evidence of organization of clot and slight epithelial regeneration. Purulent exudate present. |

Dog No. 3—Six days

| Medication in socket | Result |
|---|---|
| Sulfathiazole and eugenol paste packed into bone area in left maxilla comparable to resection | Poor section but crystals can be distinguished in area with minimal evidences of healing. Partial regeneration of epithelium. |
| Sulfanilamide and eugenol packed into bone area in upper right maxilla comparable to resection | Small amount of crystalline material present. Minimal organization of clot. Marrow spaces surrounding area are filled with young granulation tissue. Partial epithelial regeneration. |
| Commercial paste of sulfathiazole and glycerin packed in bone area in maxilla comparable to resection | Space present but no crystalline material found. Moderate organization. |
| Commercial paste of sulfathiazole and glycerin packed in socket | Fairly marked organization and partial epithelial regeneration. A few very fine crystals could be seen in the socket. |
| Commercial paste of sulfathiazole and glycerin packed in socket | Poor section. Superficial bone necrosis with subacute inflammatory process in marrow spaces can be seen. Marked osteoclastic activity. Much early new bone formation in marrow spaces. |
| Socket dusted with sulfanilamide | Fairly marked organization. Beginning osteoid tissue formation. Partial regeneration of epithelium. No evidence of drug present. |

| | |
|---|---|
| Socket packed with sulfanilamide and eugenol paste | Crystalline material present. Subacute healing stage with new bone formation at base of socket where no drug is found. Remainder of socket shows delayed organization. |
| Socket packed with sulfathiazole and eugenol paste | Crystalline material present. Organization and healing of same degree but less extensive than in preceding socket. |
| Control—No medication | Evidence of extensive trauma. Osteoclastic resorption of alveolar bone with subacute inflammation in some marrow spaces. Healing of same degree but less extensive than in other sockets in this dog. Delay probably due to extensive trauma occurring in extraction. |

Dog No. 4—Ten days

| Medication in socket | Result |
|---|---|
| Socket dusted with sulfathiazole powder | Partial organization. Marked new bone formation which is more extensive than in six day dog. No crystalline material present. |
| Socket packed with commercial paste of sulfathiazole and glycerin | Vegetable debris and fine crystalline material present in socket. Subacute inflammation in marrow spaces. Almost no healing of socket proper. |
| Socket packed with sulfathiazole and eugenol paste | Vegetable debris and fine crystalline material present. Subacute inflammation which extends into marrow spaces. Delayed healing as compared to other areas in same animal. |
| Control—No medication (root fragment present) | Subacute inflammation which is more active around root fragment. Marked evidence of traumatic bone destruction with associated resorption and marked new bone formation. |

Dog No. 5—Twenty days

| Medication in socket | Result |
|---|---|
| Commercial paste of sulfathiazole and glycerin packed into bone area comparable to resection | No evidence of crystalline material present. Residual area filled with maturing pyogenic granulation material. Only slight unhealed defect remaining. |
| Commercial paste of sulfathiazole and glycerin packed into socket | No evidence of crystalline material present. Advanced healing and marked new bone formation in apical one third. Mature granulation tissue in middle one third and late subacute granulation tissue in coronary one third. Surface epithelium regenerated. |
| Control—No medication | Advanced organization with extensive new bone formation. |

Dog No. 6—Thirty days

| Medication in socket | Result |
|---|---|
| Commercial paste of sulfathiazole and glycerin packed into socket | Advanced healing. Socket about two thirds filled with new bone. |
| Commercial paste of sulfathiazole and glycerin packed into socket | Almost complete healing. Marked and active regeneration of bone. Focal area of inflammation around foreign vegetable material. |

| | |
|---|---|
| Sulfathiazole powder dusted into socket (small root fragment present) | Almost complete healing. Advanced and active bone regeneration. Focal area of inflammation and foreign body reaction around small root fragment. Moderate fibrosis of surrounding marrow spaces. |
| Paste of sulfathiazole and eugenol packed into socket | Socket completely closed. Minimal evidence of bone regeneration. Mass of crystalline material and vacuolar spaces in base of socket. This material surrounded by zone of active inflammation. Remainder of socket filled with mature vascular granulation tissue. |
| Sulfathiazole powder dusted into socket | Almost complete healing with marked bone regeneration. No evidence of crystalline material. |

One of the methods which has been advocated frequently for the application of sulfonamides to the socket is an extemporaneously prepared ointment of the powdered sulfonamide and eugenol or oil of cloves. The basis for such a procedure was the known anesthetic effect of the eugenol by which it was hoped to keep the socket comfortable while at the same time obtaining the antibacterial effect of the sulfonamide. Unfortunately the sulfonamides tend to harden and cake when mixed with these drugs, and we felt that this method of application might interfere with the healing of the socket. This presumption has been well substantiated by the results of this study.

### Inflammation in Treated Areas

It will be noted that, in every instance in which sulfathiazole and eugenol paste was used, crystals of sulfathiazole were still present when the socket was sectioned. Even in the case of the thirty day dog in which sockets treated in other ways were almost completely healed, a mass of sulfathiazole was found in the base of the socket treated with sulfathiazole and eugenol and it was surrounded with a zone of active inflammation (Figs. 1, 2 and 3). This socket had been completely closed by regeneration of epithelium but bone regeneration was much delayed as compared with other sockets in the same dog, most of the socket being filled with mature vascular granulation tissue. Comparable results were seen in all other sockets and bone cavities in which sulfathiazole and eugenol were used.

When a paste of sulfanilamide and eugenol was used, the remaining crystalline material was less than in the case of sulfathiazole and the inhibition of healing seemed less marked. It should be pointed out that crystalline material could be demonstrated in sockets treated with sulfanilamide and eugenol after as long as six days following implantation (Dog No. 3, Fig. 4) and that such sockets showed delayed organization as compared with other sockets in the same animal.

### Irritation Caused by Eugenol

There was evidence that some of the irritation and delayed healing was due to the eugenol. In many of the sections a yellow-tinged border, which was interpreted as being caused by eugenol, could be seen around the crystalline mass and evidences of irritation were particularly marked about such areas. It is well known that eugenol has irritant as well as anesthetic properties, and to check its effect on living tissue a few drops were injected into rabbit muscle. The animal was allowed to live ten days and then killed. Histologic sections were prepared of the area. The entire area of muscle surrounding the point of injection showed Zenker's necrosis. In the fascia of the area a necrotizing hemorrhagic process was present, and a portion of the muscle showed a similar process. Thus we are

justified in attributing a portion of the observed irritation and delayed healing in sockets treated with the sulfonamide-eugenol paste to the eugenol itself. Regardless of the exact source of the irritation, no socket or other bone cavity can possibly heal normally when a foreign material used for medication purposes remains indefinitely. Since sulfanilamide and eugenol paste has been found in sockets six days after its implantation and sulfathiazole and eugenol thirty days after application, it seems clear that this form of sulfonamide medication is contraindicated.

The commercial sulfathiazole-glycerin ointment did not show such a marked tendency to cake in sockets nor to delay healing as was seen with the eugenol ointments. In one socket some crystals could be demonstrated after six days (Dog No. 3) and in another they were seen after ten days (Dog No. 4, Fig 5). Other sockets from the same dog are shown in Figures 6 and 7. Crystalline material was absent in most of the sockets treated with this preparation and in the twenty and thirty day dogs there was no evidence of delayed healing as compared with other sockets in the same animals. On the other hand in the three, six and ten day dogs poorly formed and organized clots were seen where this material was used, and the socket which was treated with this preparation in the ten day dog was much less healed than the socket which was lightly dusted with sulfathiazole. A rather consistent and possibly significant finding was the presence of foreign vegetable material in sockets medicated with this paste (Dog No. 2). Although not a positive criterion, this finding would seem to indicate the lack of a well formed blood clot, thus allowing the entrance of food material into the socket.

*Fig. 1.—Low power magnification of maxillary right molar region of thirty day dog. The socket was packed with a paste of sulfathiazole and eugenol. The socket was completely closed by regeneration of epithelium, but regeneration was much delayed (compare with Figures 2 and 3, which show sockets from the same dog). A mass of crystalline material and vascular spaces can be seen at the base of the socket below the mature vascular granulation tissue with which it is briefly filled. A zone of active inflammation surrounds the crystalline material*

## Dry Powders Preferred

On the basis of this study this preparation is unquestionably superior to a sulfonamide-eugenol ointment, and its use may have some value in the treatment of large surgical defects such as might result from the removal of impacted mandibular third molars where adequate clot formation is improbable or where the size of the clot might lead to its deterioration before organization could take place.[19] The use of such a preparation would appear to be of questionable value in cases of uncomplicated extractions in which adequately formed and organized clots can be anticipated.

When dry sulfonamide powders were

19. Millbon, J. A.; Austin, L. T.; Stafne, E. C., and Gardner, B. S., Evaluation of the Sulfa Drug and Other Dressings in "Dry Socket" in Lower Third Molars. *J.A.D.A.* 30:1839 (December 1) 1943.

packed or dusted into the sockets there was no evidence of retention of the foreign material even in the three day dogs (Dogs No. 1 and No. 2) and no delay in healing could be demonstrated. Those sockets into which the sulfonamide was dusted showed well formed and organized clots in the early stages of healing and seemed to make normal progress toward complete healing in the ten, twenty and thirty day dogs. Thus this study would indicate that the dry sulfonamide powders are more desirable for general use in the extraction socket than are preparations of ointments. Because of the ease of handling and the even distribution of the drug over the walls of the socket, we favor the use of a standard powder atomizer for applying crystalline sulfonamides to the socket. It is interesting to note that several of the sockets that were dusted with sulfonamides or used as controls in the twenty and thirty day dogs were so well healed clinically that they were lost by the technician who prepared the jaws for sectioning.

This study was not designed to determine whether the application of the sulfonamides would produce a more rapid healing of the sockets as compared with controls in the same animal. Because of the many variables involved, any attempt in this direction would require a much larger series of animals and probably would not be valid as an indication of what would happen in the human being since it is well known that the mouth tissues of the dog are much more resistant to infection than those of man. Likewise this study was not intended to establish the superiority of either sulfanilamide or sulfathiazole, but the findings did parallel those of other investigators[14, 16] who have demonstrated that sulfanilamide has less tendency to be retained in a wound and to delay healing than does sulfathiazole. On the other hand it is well established that sulfathiazole has a wider range of effectiveness.

To summarize, this study was undertaken to determine which of the several methods of applying sulfonamides to extraction sockets and comparable areas in the mouth would be tolerated best by the tissues. It was demonstrated that combinations of the sulfonamides and eugenol were highly irritating to the tissues and were not completely eliminated from the area even at the end of a thirty day period. A 60 per cent sulfathiazole-glycerin ointment did not cause distinct irritation and delay in healing, but in the early stages of healing poorly formed and unorganized clots were seen when it was used. Dry sulfonamide powders dusted into the socket did not cake and were not retained as a foreign body. Thus, in cases

*Fig. 2.—Low power magnification of mandibular left bicuspid region of thirty day dog. The socket was packed with a commercial paste of sulfathiazole and glycerin. Marked regeneration of bone can be seen in the basal two thirds of the socket, with complete closure of the socket by epithelial regeneration, and also a small focal area of inflammation in the coronal one third where bone regeneration is less complete. Under high power magnification a small bit of foreign vegetable material could be identified as the cause of this inflammation. No crystalline material could be identified.*

*Fig. 3.—Low power magnification of the socket of the maxillary left molar of thirty day dog. The socket was lightly dusted with sulfathiazole powder. Almost complete bone regeneration took place in this socket. No crystalline material could be identified*

in which sulfonamides are to be used for medication after extraction, the dusting of the socket with the dry crystalline powders appears to be a satisfactory method of application.

### Sulfadiazine for Systemic Medication

The preceding extensive discussion of the possible dangers of local and systemic sulfonamide therapy should not be construed as an attempt to discourage the rational use of the sulfonamides in dentistry. On the contrary, the sulfonamides have been and probably will continue to be of value in dentistry when their use is based on established therapeutic values and limited by their known dangers. The choice of the drug should not be a matter of chance but should be in accord with known variations in effectiveness among the sulfonamide group against specific organisms. In dentistry the most common severe infections encountered are sulfonamide-sensitive: those caused by Lancefield's Group A of the hemolytic streptococci, the staphylococcus group and the alpha hemolytic streptococcus group. The Council on Pharmacy and Chemistry[6] recommends sulfadiazine as the drug of choice for the Lancefield's Group A infections, and sulfadiazine or sulfathiazole is recommended for staphylococcus and sulfonamide-sensitive strains of alpha hemolytic streptococcus infections. The additional fact that sulfadiazine is generally less toxic than sulfathiazole[5] has led to its extensive use for systemic sulfonamide medication in dentistry. In severe infections a bacteriologic diagnosis should always be made and the choice of sulfonamide might be altered on its result. For example, if a bacteriologic examination showed that a pyogenic infection in or about the mouth was actinomycosis, the sulfonamide of choice would then be either sulfanilamide or sulfapyridine rather than sulfadiazine.[6] Preliminary reports indicate that penicillin may be more effective in the treatment of actinomycosis than are the sulfonamides.[20]

None of the sulfonamides are effective against the enterococcus group of streptococci or the anaerobic streptococci. Furthermore, with the possible exception of trachoma, follicular conjunctivitis, venereal lymphogranuloma and molluscum contagiosum, the sulfonamides are ineffective against diseases of virulent origin.[6]

### Sulfathiazole and Endocarditis

On the basis of present evidence sulfathiazole appears to be valuable as a preoperative medication for patients with valvular defects of the heart. It is well known that such persons are subject to the implantation and growth of microorganisms on the injured heart valves leading to a disease known as subacute

20. New and Nonofficial Remedies. Chicago: American Medical Association, 1946, p. 213.

bacterial endocarditis. It has been further shown that frequently after the extraction of teeth there is a brief period of transient bacteremia during which there are viable organisms in the blood stream. In a high percentage of instances these organisms belong to the Streptococcus viridans strain which in turn is usually the infecting agent in subacute bacterial endocarditis.[21-24]

Although a growing number of cases arrested by treatment with penicillin have been reported, this condition has been almost 100 per cent fatal in the past and will continue to kill many of its victims in the future in spite of penicillin. Therefore every possible effort should be made to protect the patient with a valvular disease against these postoperative "showers" of microorganisms in the blood stream. Northrop and Crowley[25] have demonstrated that the administration of 5 gm. of sulfathiazole three hours before extractions affords the patient at least a partial protection against such bacteremias. These investigators are now studying the value of penicillin for this purpose, and it appears that it may be more effective than sulfathiazole.[26]

In dentistry the sulfonamides have found a wider use for topical than for systemic administration. Although the early tendency to regard the local application of sulfonamides as a remedy for a wide variety of dental ailments has not been supported by acceptable scientific data, certain values and limitations have become well defined.

The dangers of sensitization and inhibition of healing from improper local use of sulfonamides have been discussed. Another point of importance to those using the sulfonamides locally is the demonstrated fact that their action is inhibited by the presence of p-aminobenzoic acid.[27] This substance is present in necrotic tissue, pus and tissue exudates, and thus thorough cleansing of any infected area is indicated before the topical application of a sulfonamide. Furthermore, most local anesthetics are esters of p-aminobenzoic acid and will break down in the tissues, releasing the parent substance, which in turn will inhibit the action of sulfonamides.

Thus ethyl aminobenzoate (benzocaine) should not be used concurrently with sulfonamides. Since it is only slightly soluble it will remain in the area for some time, slowly producing p-aminobenzoic acid and inhibiting the action of the sul-

21. Okell, C. C., and Elliott, S. D., Bacteriaemia and Oral Sepsis With Special Reference to Aetiology of Subacute Endocarditis. *Lancet* 2:869 (October) 1935.

22. Palmer, H. D., and Kempf, Myra, Streptococcus Viridans Bacteremia Following Extraction of Teeth; Case of Multiple Mycotic Aneurysms in Pulmonary Arteries: Report of Cases and Necropsies. *J.A.M.A.* 113:1788 (November 11) 1939.

23. Northrop, P. M., and Crowley, M. C., The Prophylactic Use of Sulfathiazole in Transient Bacteremia Following the Extraction of Teeth. A Preliminary Report. *J. Oral Surg.*, 1:19 (January) 1943.

24. Burket, L. W., and Burn, C. G., Bacteremias Following Dental Extraction. Demonstration of Source of Bacteria by Means of a Non-Pathogen (Serratia Marcesens). *J. D. Res.* 16:521 (December) 1937.

25. Northrop, P. M., and Crowley, M. C., Further Studies on the Effect of the Prophylactic Use of Sulfathiazole and Sulfamerazine on Bacteremia Following Extraction of Teeth. *J. Oral Surg.* 2:134 (April) 1944.

26. Northrop, P. M., Personal Communication.

27. Janeway, C. A., Method for Obtaining Rapid Bacterial Growth in Cultures From Patients Under Treatment With Sulfonamides. *J.A.M.A.* 116:941 (March 8) 1941.

*Fig. 4.—Low power magnification of the bone area comparable to resection from the right side of the maxilla of six day dog. This area was packed with a paste of sulfanilamide and eugenol. A small amount of crystalline material is demonstrable at the base of the area. There is minimal organization of the clot and the marrow spaces surrounding the area are filled with young granulation tissue*

*Fig. 5.—Low power magnification of the mandibular right bicuspid region from ten day dog. This socket was packed with a commercial paste of sulfathiazole and glycerin. A large amount of vegetable debris was present along with traces of fine crystalline material. A subacute inflammatory process is seen in the marrow spaces immediately surrounding the socket. There is no blood clot present and almost no evidence of initiation of healing*

fonamide. Procaine and monocaine are both capable of producing p-aminobenzoic acid, but due to the fact that they are soluble they will be more rapidly absorbed from the area and presumably will not produce prolonged inhibition of sulfonamide action. Since dry crystalline sulfonamides are not bacteriostatic, and pathogenic bacteria have been isolated from them, the use of sterile sulfonamides is indicated when they are to be applied to open wounds. Sterile sulfonamide powders are available in hermetically sealed containers prepared by the manufacturers.[5]

Local use of the sulfonamides in dentistry has been proposed for a number of purposes. One of the earliest and most extensive uses has been in prophylaxis against infection in extraction sockets and the treatment of infected sockets. The clear-cut evaluation of this use has been difficult because of the many uncontrollable factors involved. Much of the earlier literature on this phase of dental sulfonamide treatment has been reviewed previously,[4,28] and it seems unnecessary again to cover the many reports which have been published on this subject. Perhaps the present trend can best be summarized by saying that many investigators are now of the opinion that routine medication with a sulfonamide in every simple, uncomplicated extraction is neither necessary nor desirable. In the presence of periapical disease or extensive trauma which might predispose to infection, or in the presence of established infection, the use of sulfonamides is justified.

## Dry Sockets

Millhon, Austin and others,[19,29] have used a dressing of 60 per cent sulfathiazole in a water-soluble glycerin base in lower third molar sockets with an apparent reduction in the number of dry sockets resulting. In 304 unmedicated sockets they reported dry sockets occurring in 51 cases (16.8 per cent) and in 397 sockets medicated with 60 per cent sulfathiazole in glycerin base 11 cases (2.8 per cent) of dry socket developed. It should be emphasized that these were all large sockets from the removal of impacted lower third molars and the authors do not attribute this reduction in dry sockets to the sulfathiazole alone. They credit much of its value to a mechanical displacement of the central portion of the clot. This apparently reduces the size of the clot and makes infection and sloughing of the clot less liable to occur. The authors emphasize the fact that use of the sulfonamides will not avoid "those disagreeable results that would be expected to follow a careless

28. Ostrander, F. D., Sulfonamides in Dentistry. *J.A.D.A.* 30:1899 (December 1) 1943.

29. Austin, L. T., Use of Petrolatum as Dressing in Third Molar Sockets: Report of a Case. *J. Oral Surg.* 4:148 (April) 1946.

*Fig. 6.—Low power magnification of the mandibular left bicuspid region from ten day dog. This socket was packed with a paste of sulfathiazole and eugenol. Much vegetable debris is seen in this socket, and the fine material near the base of the socket could be identified under the microscope as refractory crystals. No blood clot is present and there is no evidence of initiation of new bone formation. Healing is markedly delayed as compared with Figure 7 for the same dog*

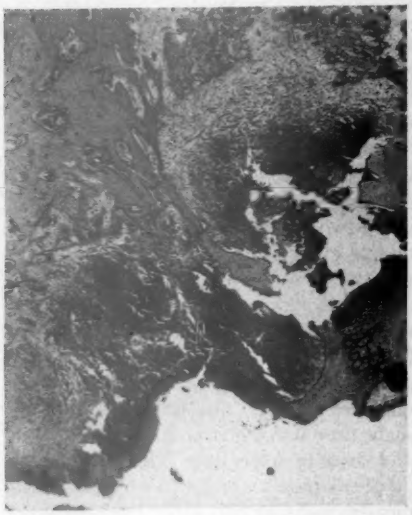


*Fig. 7.—Low power magnification of maxillary left bicuspid region from ten day dog. This socket was lightly dusted with sulfathiazole powder. Healing progressed well in this section with partial organization and marked new bone formation at base of socket. No crystalline material appeared in this socket*

surgical technic." They use sulfathiazole in complete upper or lower alveolectomies, cyst cavities and extraction of impacted upper teeth, but for these purposes they prefer to dust lightly with sulfathiazole powder blown in with a powder atomizer.

Many clinicians and investigators have advocated the sulfonamides for prophylactic use in various types of contaminated wounds, with the Council on Pharmacy and Chemistry recommending sulfanilamide as the drug of choice.[6] That this type of use has not passed the controversial stage is emphasized by a recent War Department directive.[30] This directive states that the routine practice of local application of crystalline sulfonamides to wounds as an emergency aid and prior to initial surgical treatment of the wound will be discontinued. The local application of these compounds to wounds not involving serous cavities following surgical treatment of the wound will also be discontinued, and their local use in wounds involving serous cavities is not recommended. Thus it would appear that some of the highly optimistic reports which appeared in the early years of the war were premature and gave an undue amount of credit to the local application of sulfonamides for the decrease in wound infections as compared with World War I.

### Vincent's Infection

Numerous attempts have been made to apply the sulfonamides in the treatment of periodontal disease, but it can be said, with assurance, that the sulfonamides have no place in the treatment of

30. Local Application of Crystalline Sulfonamides Discontinued. *J.A.M.A.* 128:597 (June 29) 1945.

periodontoclasia and, with the possible exception of the acute type of case, there has been little success in the treatment of Vincent's infection. Manson and Craig[31] reported the treatment of acute Vincent's angina with tonsillar lesions by the use of sulfathiazole dissolved on the tongue. One 0.5 gm. tablet was used every two hours during the day and two tablets every four hours at night. They reported that in a series of 36 patients treated by this method the temperature usually returned to normal in twenty-four hours with the clinical symptoms almost always disappearing by that time. Only one case recurred and the average treatment time was cut from ten days to three and three quarters days. The older method of treatment which was used as a comparison included the use of neoarsphenamine locally as well as intravenously. Since neoarsphenamine is of questionable value in the treatment of Vincent's infection, this report cannot be considered conclusive evidence that sulfathiazole is the drug of choice.

Recently sulfathiazole gum has been widely advocated for treatment of Vincent's infection of the mouth. The data now available to the Council on Dental Therapeutics do not establish it as superior to usual methods of treatment.[32] Certainly it can be said that the use of sulfonamides in any form has not eliminated the necessity for the recognition and proper treatment of the many predisposing factors such as inadequate diet, lowered systemic resistance, poor oral hygiene and improperly constructed dental restorations.

Sulfonamides have been used to a limited extent in the treatment of infected root canals but with generally disappointing results. At the School of Dentistry, University of Michigan, the sulfonamides failed to give results superior to those obtained by standard methods of treatment,[28] and Grossman[33] was unable to demonstrate a superiority for sulfonamides over other agents in treatment of the root canal.

## Summary

The early period of trial and error treatment with sulfonamides is now past, and the application of the sulfonamides in medicine and dentistry should be based on their known pharmacologic properties and their clinical efficacy against certain bacterial species. Conversely their use should be limited by their well established dangers and lack of effectiveness against certain bacterial infections and nearly all virus infections.

In dentistry the sulfonamides have been established as useful when administered systemically for the treatment of acute infections in and about the mouth when such infections are caused by sulfonamide-sensitive organisms, and preoperatively to control bacteremias following tooth extraction. Minor oral infections should not be treated by systemic administration of sulfonamides because of the potential dangers of producing serious toxic effects, sensitization and sulfonamide-resistant strains of organisms.

The topical administration of sulfonamides in dentistry appears justified as a prophylactic measure in the socket in cases in which severe trauma, extensive periapical disease or existing infection would predispose to postoperative infections. On the other hand, presently available data do not establish the necessity for routine medication with sulfonamides after simple uncomplicated extractions. When the sulfonamides are used in any postoperative or accidental wound, they should be used sparingly and in a form that will not cake or harden because large quantities which are not rapidly absorbed

31. Manson, W. W., and Craig, I. T., Treatment of Vincent's Angina With Sulfathiazole. *J.A.M.A.* 127: 977 (February 3) 1945.

32. Council on Dental Therapeutics, Council Discusses Present Status of Sulfathiazole Gum. *J.A.D.A.* 34:700 (May 15) 1947.

33. Grossman, L. I., Treatment of Pulpless Teeth With a Concentrated Sulfonamide Solution. *J.A.D.A.* 32:1432 (December 1) 1945.

will produce delay in healing.

In the fields of periodontia and endodontia the sulfonamides are of limited value, and in no case is the use of sulfonamides a substitute for careful surgical or aseptic technic nor for adequate postoperative care. Rational use of the sulfonamides can be of real value to the dental therapist but their indiscriminate and reckless use has no place in the practice of either medicine or dentistry.—*School of Dentistry, University of Michigan.*

# GINGIVAL DISEASE IN POSTWAR ITALY (1945): I. PREVALENCE OF GINGIVITIS IN VARIOUS AGE GROUPS

Isaac Schour, D.D.S., Ph.D.,* and Maury Massler, D.D.S., M.S.,† Chicago

A PRELIMINARY and superficial oral examination of several population groups in postwar Italy left the impression that the prevalence of gingival disease was relatively high when compared with that in comparable age groups in the United States. It therefore seemed desirable to determine the prevalence of gingival disease in a larger group of persons and to employ some quantitative method of evaluation. Such a method would permit comparison of the findings in various cities in Italy and in various parts of the world. Several valuable contributions to this problem have been reported in the literature.[1-4]

For the purposes of this study, an attempt was made to develop a simple quantitative and qualitative approach to the assessment of gingival disease in specific age groups.

## Material Studied

The dental examination (on 3,905 persons) was part of a general medical survey conducted in various cities in Italy by the Italian Medical Nutrition Mission. The material here reported represents part of the material collected in four out of the seven areas covered by the team of medical and dental investigators.

The patients examined in Naples and Varese were from a low economic level. They were unclean and malnourished and suffered from various undiagnosed chronic ailments. They represented, as closely as could be determined, the average low economic group living in these two cities. The patients examined in Cagliari and Catanzaro were better nourished and represented a somewhat higher economic level.

## Method

Each patient was examined with a mouth mirror in good natural light. The examiners[5] had been trained by prelim-

This study was conducted under the auspices of the Italian Medical Nutrition Mission. Grateful acknowledgment is given to the Unitarian Service Committee, the Congregational-Christian Service Committee and the UNRRA which provided the necessary facilities for this investigation.

*Professor and head of Department of Histology, University of Illinois, College of Dentistry.

†Associate professor of pedodontics, University of Illinois, College of Dentistry.

1. King, J. D., *Dental Disease in the Isle of Lewis.* Medical Research Council, Special Report Series, No. 241. London: His Majesty's Stationery Office, 1940.

2. King, J. D.; Franklyn, A. B., and Allen, I., Gingival Disease in Gibraltar Evacuee Children. *Lancet* 1:495 (April 15) 1944.

3. King, J. D., Gingival Disease in Dundee. *D. Record* 65:9 (January); 32 (February); 55 (March) 1945.

4. Linghorne, W. J., and others, The Relation of Ascorbic Acid (Vitamin C) Intake to Gingivitis. *J. Canad. D. A.* 12:49 (February) 1946.

5. The Italian dentists who assisted in this work were M. Vitale, D. DiLello and V. Coiro.

inary practice to evaluate the gingival condition on a common basis. The examination for the most part was confined to the labial gingivae of the lower anterior region from cuspid to cuspid. A detailed analysis of the data obtained in another study[6] showed that the gingivae of the lower anterior teeth provide a fairly adequate index of the general gingival condition of the mouth. The amount of time available for each oral examination was limited but was sufficient for this relatively rapid method of observation.

***Quantitative Evaluation.***—The basic idea of the quantitative evaluation rested on the assumption that the gingivae respond to local or systemic disturbances most frequently by varying degrees of inflammation. The severity of the inflammation was therefore graded numerically in successive degrees according to increasing intensity and extent as follows (see the accompanying figure):

0 = No gingivitis in any region of the mouth.

1+ = Mild gingivitis: localization of the inflammation usually to the interdental papillae or free gingival collar of one to three of six lower anterior teeth.

This category might be questioned by some clinicians who might prefer to include such very mild inflammatory changes within the range of normality. We prefer to consider this category as perhaps common and present in the "average" person but nevertheless not normal and certainly not ideal. This difference in clinical evaluation may in part account for the wide discrepancy in the prevalence of gingivitis reported by various observers.

2+ = Moderate gingivitis: extension of the inflammation to form a more or less continuous band along the marginal gingivae of more than three regions or teeth. The redness and glazing are increased in intensity, and slight detachment of the gingivae is suggested.

3+ = Severe gingivitis: extension of the inflammation from the marginal gingivae into the attached gingivae (attached to underlying bone). Redness, swelling, edema, loss of stippling and loss of tonus are prominent. Spontaneous bleeding is usually present.

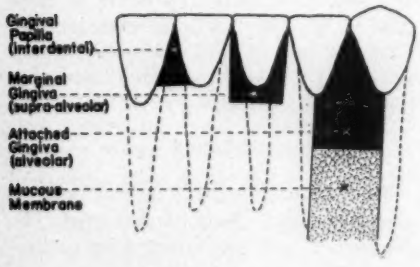
4+ = Very severe gingivitis: very severe generalized periodontitis. Vincent's infection was included in this category but was rarely encountered.

When doubt existed as to the exact designation of the severity of the gingivitis, the gingivae in other regions of the mouth also were inspected for final evaluation. The regions were inspected in the following order: labial region of the upper anterior area; buccal region of the upper molar area; buccal region of the lower posterior area; palatal region of the upper posterior area. This evaluation is valid since the designation of 1+, 2+, 3+ or 4+ is not an absolute value but a relative one.

***Average Degree of Gingivitis per Person.***—After the data on the individual patients were accumulated, it was thought desirable to indicate numerically the average degree of gingivitis found in each age group. An average for each age group was therefore derived by multiplying the number of cases in each category by the number designating the degree of gingivitis (0, 1+, 2+, 3+, 4+) and dividing the sum by the total number of persons examined.

***Qualitative Evaluation.***—Since there are in

6. Massler, Maury, and Schour, Isaac, Gingival Disease in Postwar Italy (1945). II. Analysis in Teen Age Persons. To be published.




*Subdivisions of the gingiva*

general two types of inflammatory reactions, it seemed logical to designate the gingivitis not only according to the extent and intensity of the inflammation (0, 1+, 2+, 3+, 4+) but also according to the type of gingivitis, that is, acute or chronic gingivitis.

The designations of these two types are not mutually exclusive classifications, so that the same patient frequently showed both acute and chronic inflammation, each of which was recorded separately.

***Acute Gingivitis.***—Gingivitis was considered to be acute when the reaction appeared to be of recent and short duration and was characterized by active hyperemia. The gingival color tends to be bright red, and the surface lacks stippling and is glazed. The tissue is firm and turgid but not hypertrophied.

***Chronic Gingivitis.***—Gingivitis was considered to be chronic when the reaction appeared to be of long duration and was characterized by passive hyperemia. The gingival color is purplish red (magenta), and the tissue tends to be swollen, spongy and boggy. The normal tonus is lost, and bleeding occurs readily. Pocket formation is progressive. In the more advanced stages (designated as 3+ and 4+), mobility of the teeth is increased and bleeding may become profuse. Stage 4+ of chronic gingivitis represents a severity of the gingival and periodontal alteration which will not yield to treatment and calls for extraction of all teeth involved.

For purposes of simplification, subacute changes were classified as chronic.

Since 3+ or more designated extension of the inflammatory reaction into the attached gingivae and thus into the periodontal structures, this category included all cases of periodontitis.

## Findings

***Prevalence of Gingivitis.***—The number of persons exhibiting gingivitis increased with age from 40 per cent in the group 6 to 10 years of age to 98 per cent in the group 51 to 60 years of age (Table 1).

If the degree of gingivitis is charted against age, not only does the number of persons affected increase with age but also the severity of both acute and chronic gingivitis increases with advanced age (Table 2).

***Prevalence in Various Age Groups in Naples.***—Since the number of persons examined in Naples alone represents almost half of the total number examined and since more definitive data could be obtained from the persons examined in one city than in four, the data obtained from Naples were subjected to more careful analysis (Tables 3 and 4). Reference to Tables 1 and 2 shows that the same gen-

**Table 1.—Percentage of patients with gingivitis among 3,905 persons examined in four cities in Italy (1945)**

| Age group (in years) | Naples | | Varese | | Catanzaro | | Cagliari | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Number examined | Per cent | Number examined | Per cent | Number examined | Per cent | Number examined | Per cent | Number examined | Per cent |
| 6-10..... | 309 | 54.0 | 101 | 26.0 | 118 | 18.0 | 154 | 30.0 | 682 | 40.0 |
| 11-20..... | 309 | 68.6 | 133 | 64.0 | 120 | 22.0 | 159 | 50.0 | 721 | 55.0 |
| 21-30..... | 247 | 84.6 | 91 | 84.5 | 119 | 58.0 | 145 | 69.0 | 602 | 72.0 |
| 31-40..... | 274 | 92.7 | 163 | 95.0 | 119 | 76.0 | 146 | 83.0 | 702 | 87.0 |
| 41-50..... | 252 | 97.2 | 124 | 97.0 | 120 | 85.0 | 149 | 90.0 | 645 | 94.0 |
| 51-60..... | 197 | 98.0 | 105 | 98.0 | 114 | 98.0 | 137 | 98.0 | 553 | 98.0 |
| Total | 1,588 | ..... | 717 | ..... | 710 | ..... | 890 | ..... | 3,905 | ..... |

eral trends were observed in each of the cities.

In the group 6 to 10 years of age, approximately half the number of Neapolitan children examined had gingivitis, most of them (73 per cent) to a mild degree. In the group 11 to 20 years old slightly more than two-thirds of the persons had gingivitis, most of them (56 per cent) to a mild degree. In the group 21 to 30 years old, almost 85 per cent suffered from gingivitis, more than half of them to a mild degree and almost a third to a moderate degree. In the group 31 to 40 years of age almost 93 per cent suffered from gingivitis, almost half of the group to a moderate degree and only a third to a mild degree. In the group 41 to 50 years old almost every person suffered from gingivitis, only a quarter of them to a mild degree, half to a moderate degree and a quarter to a severe degree. In the oldest age group, 51 to 60 years, gingivitis was practically universal; less than 10 per cent of the group had gingivitis to a mild degree, 43 per cent had gingivitis to a moderate degree and 46 per cent to a severe degree.

*Average Degree of Gingivitis.* — The increase in the severity of the gingivitis with age is brought out by calculating the average degree of gingivitis per person (Table 3). This figure is obtained by multiplying the percentage of cases in each category by the number designating that category (0, 1+, 2+, 3+, 4+), adding the five categories and dividing by 100. In the group 6 to 10 years of age, the average child had a gingivitis of 0.7, indicating a mild inflammation of the papillae of only two or three of the lower anterior teeth. The degree of inflammation for persons 21 years of age was 1.5, indicating that the inflammation not only involved more papillae but also had extended to the marginal gingivae and formed a continuous band of inflamed gingivae over four or five teeth. In patients aged 41 years the inflammation was definite and had affected almost all the marginal gingivae of the lower anterior teeth. In patients 51 years of age the inflammation was se-

**Table 2.—Prevalence of various degrees of acute and chronic gingivitis in 3,905 patients 6 to 60 years of age examined in four cities* of Italy in 1945**

| Age group (in years) | Number of persons examined | Percentage of persons examined with gingivitis | | | | | |
|---|---|---|---|---|---|---|---|
| | | None (0) | Mild (1+) | Moderate (2+) | Severe (3+) | Very severe (4+) | Average degree per person |
| **Acute Gingivitis** | | | | | | | |
| 6-10 | 682 | 59.7 | 32.4 | 6.6 | 1.1 | ..... | 0.49 |
| 11-20 | 721 | 44.7 | 48.3 | 6.7 | 0.3 | ..... | 0.63 |
| 21-30 | 602 | 29.1 | 54.0 | 15.3 | 1.6 | ..... | 0.89 |
| 31-40 | 702 | 18.1 | 55.2 | 24.5 | 2.1 | 0.1 | 1.10 |
| 41-50 | 645 | 12.9 | 53.3 | 29.2 | 4.6 | ..... | 1.26 |
| 51-60 | 553 | 12.0 | 49.0 | 31.1 | 7.4 | 0.5 | 1.35 |
| **Chronic Gingivitis** | | | | | | | |
| 6-10 | 682 | 76.6 | 19.2 | 4.1 | 0.1 | ..... | 0.28 |
| 11-20 | 721 | 56.4 | 38.8 | 4.0 | 0.8 | ..... | 0.49 |
| 21-30 | 602 | 28.6 | 54.0 | 14.6 | 2.8 | ..... | 0.91 |
| 31-40 | 702 | 12.7 | 39.8 | 36.4 | 9.0 | 2.1 | 1.48 |
| 41-50 | 645 | 5.6 | 22.8 | 47.3 | 18.3 | 6.0 | 1.96 |
| 51-60 | 553 | 2.2 | 10.5 | 42.3 | 32.4 | 12.6 | 2.53 |

*Naples, Catanzaro, Cagliari, Varese.

Table 3.—Prevalence of various degrees of gingivitis, acute gingivitis and chronic gingivitis in 1,588 patients 6 to 60 years of age examined in Naples (1945)

| Age group (in years) | Number of persons examined | Percentage of persons examined with gingivitis | | | | | Average degree per person* |
|---|---|---|---|---|---|---|---|
| | | None (0) | Mild (1+) | Moderate (2+) | Severe (3+) | Very severe (4+) | |
| | | | | Gingivitis | | | |
| 6-10 | 309 | 46.0 | 39.9 | 12.9 | 1.2 | ..... | 0.70 |
| 11-20 | 309 | 31.4 | 56.6 | 11.4 | 0.6 | ..... | 0.81 |
| 21-30 | 247 | 15.4 | 49.4 | 30.4 | 4.8 | ..... | 1.53 |
| 31-40 | 274 | 7.3 | 32.2 | 49.3 | 10.5 | 0.7 | 1.65 |
| 41-50 | 252 | 2.8 | 24.2 | 50.4 | 18.6 | 4.0 | 1.95 |
| 51-60 | 197 | 2.0 | 8.6 | 43.2 | 39.1 | 7.1 | 2.46 |
| | | | | Acute Gingivitis | | | |
| 6-10 | 309 | 4.6 | 40.1 | 11.6 | 2.3 | ..... | 0.7 |
| 11-20 | 309 | 33.7 | 53.7 | 12.0 | 0.6 | ..... | 0.79 |
| 21-30 | 247 | 22.7 | 46.6 | 27.5 | 3.2 | ..... | 1.11 |
| 31-40 | 274 | 15.7 | 39.5 | 39.8 | 4.7 | 0.3 | 1.34 |
| 41-50 | 252 | 7.5 | 38.1 | 44.5 | 9.9 | ..... | 1.56 |
| 51-60 | 197 | 7.1 | 29.4 | 45.6 | 16.8 | 1.1 | 1.75 |
| | | | | Chronic Gingivitis | | | |
| 6-10 | 309 | 62.8 | 28.4 | 8.5 | 0.3 | ..... | 0.46 |
| 11-20 | 309 | 50.9 | 43.0 | 5.5 | 0.6 | ..... | 0.55 |
| 21-30 | 247 | 25.5 | 47.5 | 24.6 | 2.4 | ..... | 1.04 |
| 31-40 | 274 | 12.4 | 32.0 | 45.7 | 9.5 | 0.4 | 1.53 |
| 41-50 | 252 | 5.9 | 21.5 | 49.7 | 17.0 | 5.9 | 1.95 |
| 51-60 | 197 | 2.3 | 8.1 | 38.0 | 38.0 | 13.5 | 2.53 |

*Degree 0-1, papillary gingivitis; Degree 1-2, marginal gingivitis; Degree 2-3, attached gingivitis (periodontitis).

vere and had made considerable progress into the attached gingivae—with extensive destruction of the periodontium.

*Acute and Chronic Gingivitis.*—If the incidence of acute and chronic gingivitis is considered separately (Tables 2 and 3), it can be seen that acute gingivitis is more common than the chronic form in the younger age group, and chronic gingivitis is more common than acute gingivitis in the older age group.

The average degrees of acute and

Table 4.—Prevalence of acute and chronic gingivitis in 1,588 patients 6 to 60 years of age in Naples (1945)

| Age group (in years) | Percentage of persons with gingivitis | | | Average degree per person* | |
|---|---|---|---|---|---|
| | Gingivitis | Acute inflammation | Chronic inflammation | Acute inflammation | Chronic inflammation |
| 6-10 | 54.0 | 54.0 | 37.2 | 0.7 | 0.46 |
| 11-20 | 68.6 | 66.3 | 49.1 | 0.79 | 0.55 |
| 21-30 | 84.6 | 77.3 | 74.5 | 1.11 | 1.04 |
| 31-40 | 92.7 | 84.3 | 87.6 | 1.34 | 1.53 |
| 41-50 | 97.2 | 92.5 | 94.1 | 1.56 | 1.95 |
| 51-60 | 98.0 | 92.9 | 97.7 | 1.75 | 2.53 |

*Degree 0-1, papillary gingivitis; Degree 1-2, marginal gingivitis; Degree 2-3, attached gingivitis (periodontitis).

chronic gingivitis are indicated in Tables 2 and 3. Comparison of the figures shows that, although both increase with age, the chronic form increases more rapidly than the acute form (Table 4).

## Discussion

One of the values of this study is that it paves the way for a quantitative and qualitative method of assessing gingival disease. The findings establish a base line for comparison with findings in subsequent studies.

We have been able to find in the literature only limited data on the prevalence of gingival disease in comparable population groups. These are summarized in Table 5.[1-4, 7-14] The wide range in prevalence is evident. The final evaluation of the data presented in this study awaits a repetition of this type of investigation in various parts of the United States.

The relation of nutrition and malnutrition to the incidence of gingival disease is an important consideration in dental practice. In the absence of adequate data on the incidence of gingival disease in the United States (presumably a good nutritional area), such analysis cannot be made with the data collected in Italy (an area of malnutrition). Only an impression can be recorded. Our impression is that at all age levels the incidence and severity of gingival disease were much higher in Naples than in Chicago. Comparison between Naples and Catanzaro further supports this thought. In the absence of a comparable study of gingival disease in prewar Italy, it also is not possible to assay the effects of the war period and its consequent malnutrition on the condition of the gingival tissues. Dr. Perone, assistant director of the Dental School of the University of Naples, informed us that the number of patients coming to the dental clinic for treatment of gingival and periodontal lesions has increased considerably during and after the war. This increase is in contrast to the incidence of dental decay, which apparently has not changed during the same period.

***Need for a Common Method of Assessing Gingival Disease.***—An examination of Table 5 shows the wide range in the prevalence of gingival disease reported by various observers for various geographic areas. The prevalence for similar age groups ranges from 8.8 per cent for children 4 to 16 years old in the United States[8] to 90 per cent for children 6 to 15 years of age in the Isle of Lewis.[1] Furthermore, similar groups (21 to 30 years of age) within Great Britain show a range in prevalence from 34 per cent[10] to 84 per cent.[3] It is apparent that there is no general agreement on what constitutes gingival health and gingival disease and that therefore the wide range in prevalence (8 to 90 per cent) is a result of different criteria employed by observers rather than a result of actual differences in prevalence.

Only by the employment of a common method of assessment of gingival disease will it be possible to compare the findings of investigators. Further studies are needed to develop objective criteria and qualitative and quantitative evaluations of gingival disease. A good beginning has been made by King[3] in England and Linghorne and others[4] in Canada.

***Gingivitis and Malnutrition.*** — Comparison

7. Messner, C. T.; Gafafer, W. M.; Cady, F. C., and Dean, H. T., *Dental Survey of School Children, Ages 6 to 14 Years, Made in 1933-1934 in 26 States.* Pub. Health Bull. No. 226. Washington, D. C.: U. S. Printing Office, 1936.

8. Brucker, M., Studies on the Incidence and Cause of Dental Defects in Children. III. Gingivitis. *J. D. Res.* 22:309 (August) 1943.

9. Ainsworth, N. J., and Young, M., *The Incidence of Dental Disease in Children.* Medical Research Council, Special Report Series, No. 97. London: His Majesty's Stationery Office, 1925.

10. Smart, G. A., Incidence of Gingivitis in Royal Air Force. *Brit. M. J.* 2:242 (August 19) 1944.

11. Adamson, J. D., and others, Medical Survey of Nutrition in Newfoundland. *Canad. M. A. J.* 52: 227 (March) 1945.

12. Westin, G., and others, *In an Investigation Into Questions of Social Hygiene in the Counties of Västerbotten and Norrbotten, Sweden,* Pts. II, III and IV (cited in King, 1940), 1937.

13. Day, C. D. M., Nutritional Deficiencies and Dental Caries in Northern India. *Brit. D. J.* 76: 113 (March 3); 143 (March 27) 1944.

14. Day, C. D. M., and Tandan, G. C., The Incidence of Dental Caries in the Punjab. *Brit. D. J.* 69:381 (December 2) 1940.

Table 5.—Review of literature on prevalence of gingivitis

| Country | Author | Year | Area studied | Number examined | Age group studied | Percent of population with gingivitis | Criteria of assessment | Group studied |
|---|---|---|---|---|---|---|---|---|
| United States | Messner and others[7] | 1936 | 26 states | More than 1,000,000 | 6-8 yrs.<br>9–11 yrs.<br>12–14 yrs. | 3.5<br>5.6<br>8.6 | Gums reported as "normal" or "diseased" | White boys and girls |
| | Brucker[8] | 1943 | Newark, N. J. | 1,492 | 4–16 yrs. | 8.8 | Healthy gingiva, slight and severe gingivitis | Varying socio-economic levels, 14 nationalities |
| England | King[1] | 1940 | Isle of Lewis,<br>London and Sheffield | 1,280<br>470 | 6–15 yrs.<br>6–15 yrs. | c. 90.0<br>c. 78.0 | Normal (0)<br>Slight (1)<br>Medium (2)<br>Severe (3) | |
| | King, Franklyn and Allen[9] | 1944 | London and Sheffield,<br>Gibraltar evacuees | 130<br>135 | 11–13 yrs.<br>10–14 yrs. | 90.0<br>85.2 | "Marginal" and papillary type | Gibraltar group had poor nutrition |
| | King[3] | 1945 | Dundee | 313<br>74 | 12–18 yrs.<br>21–30 yrs. | c. 88.0<br>c. 84.0 | Very detailed | Boys and girls and expectant and nursing mothers |
| | Ainsworth and Young[5] | 1925 | England and Wales | 4,063 | 2–15 yrs. | 60 | Anterior marginal gingivitis—slight, medium, severe | |
| | Smart[10] | 1944 | R.A.F.<br><br><br><br>W.A.A.F. | <br>583<br>198<br>183<br>143<br><br>225 | Men<br>25 yrs.<br>26–30 yrs.<br>31–35 yrs.<br>36+ yrs.<br>Women<br>25 yrs. | <br>c. 32.0<br>c. 37.9<br>c. 54.1<br>c. 63.7<br><br>c. 34.0 | Mild gingivitis not included | |
| Canada | Linghorne and others[4] | 1946 | R.C.A.F. | 1,448 | Men<br>30 yrs. | 20.0 | Very detailed | |
| Newfoundland | Adamson and others[11] | 1945 | | 868 | All ages | c. 45.0 | Detailed | Poor nutrition group |
| Sweden | Westin and others[12] | 1937 | Västerbotten and Norrbotten | 1,141 | School children | 86.5 | (Cited from King, 1940) | |
| India | Day[13] | 1944 | Kangra District | 200 | Boys | 81.0 | Gingivitis—slight to severe | Poor nutrition group |
| | Day and Tandan[14] | 1940 | Lahore (Punjab) | 756 | Average age 13 | 68.0 | Gingivitis—slight to severe | Children of middle class families |

of the findings in the four cities of Italy (Table 1) showed a significant difference in the prevalence of gingivitis between the two urban communities (Naples and Varese) and the two other communities (Catanzaro and Cagliari). During the surveys it was apparent that the persons examined in Catanzaro and Cagliari were better nourished than those examined in Naples and Varese. From these facts it would appear that the prevalence of gingivitis was increased in the poorly nourished groups. A detailed analysis of the distribution of different degrees of both acute and chronic gingivitis in each of the four cities, as was presented for Naples in Tables 3 and 4, was therefore prepared to check this relation. Such analysis further suggested that the prevalence and the degree of severity of the gingivitis were increased in the poorly nourished groups. Mann and others[15] indicated that a higher percentage of severe periodontal disease is present in malnourished patients than in well nourished patients.

## Summary and Conclusions

The prevalence of gingivitis in four communities in Italy in 1945 was determined from the examination of 3,905 inhabitants ranging in age from 6 to 60 years. These persons suffered from moderate to severe degrees of malnutrition, particularly in respect to deficiencies in fat, fat soluble vitamins and the vitamin B complex. The findings were:

1. Incidence of gingivitis increased with age and ranged from 40 per cent in the 6 to 10 year old group to 98 per cent in the 51 to 60 year old group.

2. The severity of the gingivitis also increased with age, starting with a mild papillary type in the 6 to 10 year old group, extending through the marginal gingivae in the middle age group and terminating in the attached gingivae in the group 51 to 60 years of age.

3. The acute form of gingivitis is more common in the younger age groups, and the chronic form predominates in the older age groups.

4. The rate of increase of chronic gingivitis is greater with age than is the rate of increase of the acute form of the disease.

5. A method of assessing gingival disease in terms of different degrees of severity (0, 1+, 2+, 3+, 4+) and in terms of acute and chronic gingivitis is presented. This method also permits numerical assessment of gingivitis for large groups of persons in terms of an average degree of gingivitis per person.

6. The prevalence and degree of gingivitis appeared to be higher in the poorly nourished groups than in the better nourished groups.—*808 South Wood Street.*

15. Mann, A. W.; Dreizen, Samuel; Spies, T. D., and Hunt, F. M., A Comparison of Dental Caries Activity in Malnourished and Well-Nourished Patients. *J.A.D.A.* 34:244 (February 15) 1947.

***Lithium Viewed as Likely Atomic Energy Source.***—A new prospective source of atomic energy is lithium, one of the few elements known to be fissionable. Some authorities are understood to believe that the atomic reaction we are most likely to use in the development of power for industrial use is the one using lithium fission, for it is far more plentiful and much cheaper than uranium.

On an equal weight basis lithium is almost three times as powerful as uranium. When bombarded with "protons," the lithium atom splits, releasing about 17.3 million electron volts. While the uranium atom releases about 200 million electron volts, it is 33.5 times more massive. However, while theoretically the lithium process is much simpler than the uranium process, there still remain some major scientific and engineering problems which must be solved.—*S. G. Ebert, Barron's National Business and Financial Weekly 27:37 (July 14) 1947.*

# ROOT CANAL TREATMENT WITH VISUAL EVIDENCE OF HISTOLOGIC REPAIR

S. Marshall Weaver, D.D.S., Cleveland

INDISPUTABLE proof that teeth with infected pulps can be properly treated and remain sterile for many years is the proposition herein set forth to the profession. A series of 8 cases is reported, with the history of the putrescent pulp, treatments (both surgical and nonsurgical), roentgenograms showing infection, root fillings and bone repair of formerly infected regions, and histologic study of the extracted teeth, decalcified, stained and sectioned, ready for microscopic study. One of these cases is described in detail. The other 7 are presented by illustrations.

In some 25 cases in which specimens were submitted for histologic examination, not one contained microscopic evidence of infectious inflammation and no polymorphonuclear leukocytic infiltration. Many slides show complete covering of the root end with new cementum and periodontal membrane. Where root ends have been curetted and the granuloma removed, the entire surface of the root is recovered with new cementum and periodontium. This does not occur in the presence of infection. Slides show many teeth that were condemned by the medical profession to be void of any sources of infection.

For the last twenty-five years newspaper reporters and radio commentators have injudiciously alleged that the death of some president or other prominent person was caused by an abscessed tooth. Some practitioners in both the dental and medical professions have used the pulpless tooth as a scapegoat for all ailments otherwise difficult to diagnose.

Many prominent men in the dental profession have continued to disagree concerning the treatment of teeth with infected pulps, thus retarding progress in solving this vital question. For a time, these opposing views were responsible for a reduction in effort by dentists to save pulpless or infected teeth and also elimination of the teaching of root canal therapy in several dental colleges.

However, a small group of men has carried on diligently and scientifically, establishing definite facts as to the proper medication and sterilization of the root canal and apical tissues and also the definite process of repair that takes place after proper treatment. I think the dental profession should furnish proof to the medical profession and to the public at large that teeth with infected pulps can be and are being rendered permanently sterile and safe.

## Interest in Oral Infection

Some medical schools lately have introduced into their curriculum a course in dental anatomy and oral infection, which is being received enthusiastically by the students.

The relation of infected teeth to systemic diseases is well established. Unfortunately, there are men in both the dental and medical professions who believe that

Read at the first meeting of the American Association of Endodontists in Chicago, February 23, 1944, and at the eighty-second midwinter meeting of the Chicago Dental Society, Chicago, February 5, 1947.

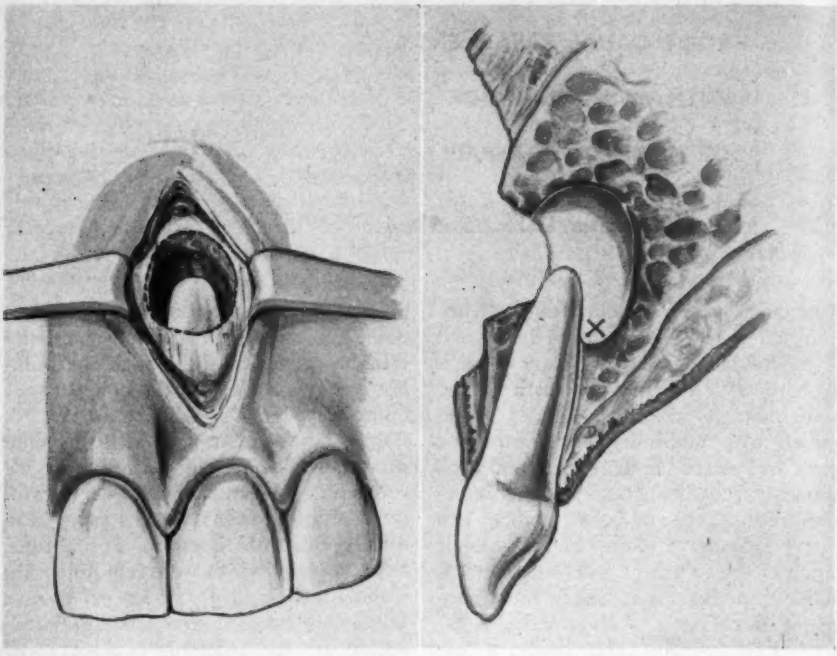


*Fig. 1.—Left: Vertical incision and window through overlying plate of bone. Right: Cross section of field of operation. Region in which complete curettage is most important is marked by X*

no tooth can be rendered permanently sterile and therefore advise radical extraction. To offset this, dentists see thousands of pulpless teeth that have given good service for many years without any harm to the patient and that roentgenographically appear to be normal.

The fact should be thoroughly established that teeth with infected pulps either must be extracted or made sterile by proper surgical treatment of the root canal. My opinion is that patients are far more anxious than some members of the dental profession to save infected teeth and also that they are willing to pay handsomely for this work. The desirability of retaining a tooth if it can be rendered sterile is unquestionable.

Many dentists are opposed to treating teeth with nonvital pulps because of lack of conclusive proof to substantiate the desirability of such treatment. Also, some dentists frankly do not like this type of work for various reasons, which is their privilege. But these men should consider seriously before extracting any of the twelve anterior teeth, especially if the patient is from 12 to 20 years of age, because replacement with bridgework in young patients will cause a certain amount of disfigurement. This disfigurement probably can be prevented by proper surgical treatment of the root canal and possibly a jacket crown.

Fortunately, there are a few men who believe that properly selected teeth with nonvital pulps can be rendered permanently sterile and give valuable service. The problem therefore resolves itself into the ability of the dentist to sterilize the infected tooth and the periapical tissue and to fill the canals with suitable material.

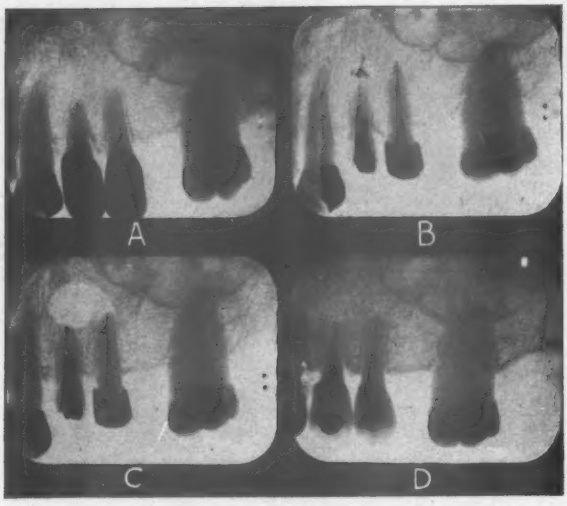



*Fig. 2 (case 1).—Second bicuspid. A, November 23, 1923; B, after filling, November 28, 1923; C, after curettage, January 14, 1924; D, four and a half years later, March 1928*

My early association with Dr. J. R. Callahan, of Cincinnati, and his faith in root canal therapy gave me enough confidence and assurance to continue this work through my entire forty-seven years of practice.

This discussion is not intended to advocate any one system of root canal therapy over another because many men are successful with their own pet technic. I am interested in trying to convince all dentists of the fact that infected teeth, properly treated and filled, are absolutely safe from reinfection and will make serviceable teeth for years.

## Cementum and Dentin

In discussing the biology of cementum and dentin, Kronfeld[1,2] said that cementum "is a product of the connective tissue of the periodontal membrane, consisting of an organic ground substance (matrix) into which inorganic salts are precipitated." Another important biologic fact is that the dentin is formed within the tooth by the pulp. All its vital connections, its metabolism, and its innervation are derived from the pulp tissue.

The dentin has no vital connection with the connective tissue but merely lies in contact with it. The organic connection between the dentin and the connective tissue later is established by a layer of cementum that is deposited on the dentinal surface from the outside.

During deposition fibers of the adjacent connective tissues are embedded into the forming cementum, establishing the first true connection between dentin and periodontium. These biologic facts should correct the erroneous idea that when the periodontal tissues around the apical end of the tooth have been destroyed, the tooth cannot be regenerated when infection has been removed. In other words, the pulp of the tooth has no part in the laying down of the cementum.

Hence, when infection has been re-

1. Kronfeld, Rudolf, *Histopathology of the Teeth.* Philadelphia: Lea & Febiger, 1933, pp. 206, 208.
2. Kronfeld, Rudolph, Zur Frage der Wurzelspitzenamputation. *Ztschr. f. Stomatol.* 26:1105 (November) 1928.

*Fig. 3 (case 1).—Photomicrograph of side of second bicuspid, showing new cementum and new periodontium*

moved, cementum is deposited as freely on teeth with nonvital pulps as on those with vital pulps. Coolidge,[3] Hill,[4,5] Hatton and co-authors[6] report that cementum is deposited on the root end and in the unfilled part of the canal with a tendency to cover the root filling material and to obliterate any lumen still present in the apex. They also showed that this

3. Coolidge, E. D., Root Resection as a Cure for Chronic Periapical Infection: a Histologic Report of a Case Showing Complete Repair. *J.A.D.A.* 17:239 (February) 1930.

4. Hill, T. J., Regeneration of Periodontal Membrane After Root Curetment. *D. Cosmos* 73:799 (August) 1931.

5. Hill, T. J., The Epithelium in Dental Granulomata. *J. D. Res.* 10:323 (June) 1930.

6. Hatton, E. H.; Moen, O. H., and Skillen, W. G., Histologic Findings in Teeth With Treated and Filled Root Canals. *J.A.D.A.* 15:56 (January) 1928.

process occurs only in the absence of infection. Therefore, this type of formation of cementum actually can be considered as the morphologic expression of root canal therapy.

## Primary and Secondary Cementum

Kronfeld[1,2] has said:

It is usual to differentiate in the study of the morphology of the cementum between primary cementum and secondary cementum.

Primary cementum contains no cells and shows only a fine fibrillated pattern at right angles to the root surface. It is usually found in the coronal portion of the root. Primary cementum rarely becomes very thick.

Secondary cementum contains cells embedded in the matrix, which gives it an appearance very much like bone. Secondary cementum is usually found in the apical portion of the tooth, although it extends crownward to a different degree in different teeth. It should be emphasized, in opposition to statements that are occasionally encountered in dental literature, that, except for their structural differences, primary and secondary cementum are not different in any way.

## Open Window Curettage

In my practice the open window apical curettage holds a prominent place in the treatment of anterior teeth (Fig. 1) and also some other teeth. First, all root canals must be filled thoroughly with a properly condensed material. In doing this, the collateral canals most likely will be filled. With this technic, I find it impossible in many cases to keep from forcing excess material through the apical foramen. Under these conditions, con-

*Fig. 4 (case 1).—Photomicrograph showing thick deposit of new cementum over entire root end of second bicuspid: A, rosin root filling; B, new cementum; C, new periodontium*

*Fig. 5 (case 2).—Patient had a spot on the lens of the eye which was diagnosed by three nationally known oculists as the result of a focus of infection. First roentgenogram in 1925 showed a faulty root canal filling (left). In 1927, patient consented to have root retreated and filled (center) and bridge restored (right). Since the eye condition failed to improve, the tooth was extracted in 1937, solely to eliminate from the patient's mind the psychologic factor of possible infection*

siderable after disturbance, possibly because of mechanical irritation, is likely to occur. Failure to fill the canal with thoroughly condensed material often is attributed to fear of causing pain.

By immediate removal of the granu-

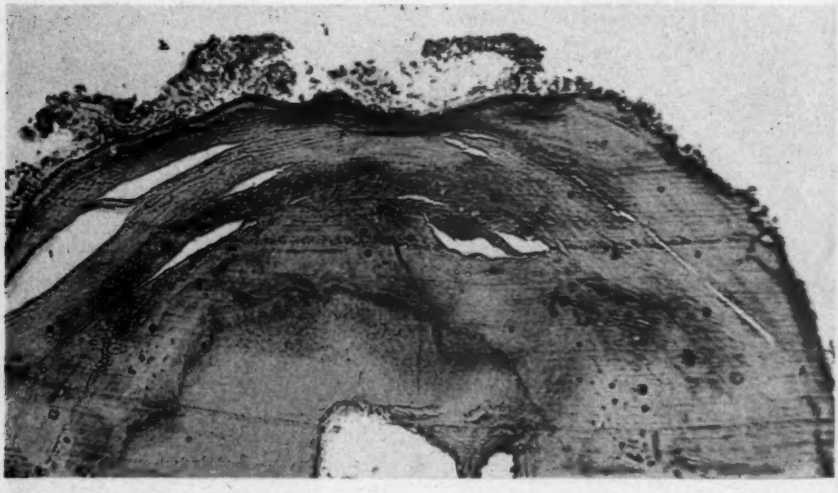


*Fig. 6 (case 2).—Routine laboratory examination showed a perfect root canal filling, complete closure of the apical foramen, with a thick layer of new cementum and periodontium and no evidence of infection. Family physician, two years after extraction, informed the patient that this spot on the lens of the eye had been present at birth*

lomatous and necrotic tissue and the excess filling material through an open window (Fig. 1, left), these conditions clear up with perfect bone repair and a new cemental covering of the root end, as is shown in subsequent figures.

After thorough curetting out of the granulomatous tissue from the bone cavity and freshening up of the cementum of the entire exposed root surface, sulfanilamide in small pieces is introduced into the cavity, crushed with artery forceps and thoroughly mixed with the blood clot. Grains 2 to 5 generally are used, according to the size of the cavity. This method, especially with free bleeding, is

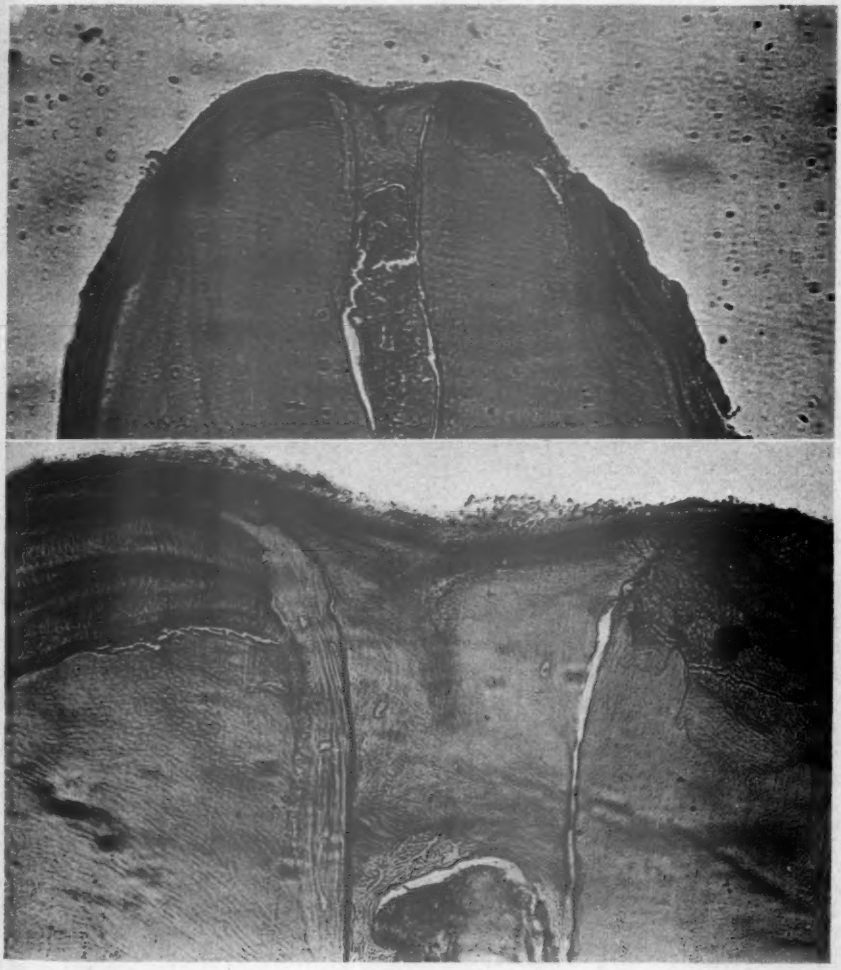


*Fig. 7 (case 3).—Pulpless tooth which was extracted after twenty years of service. Above: Photomicrograph (X 60). Below: Photomicrograph (X 240) shows sealing over of apical end. Dark region in lower center is where the root filling stopped. Apical foramen is filled in with new cementum, and entire root end is covered with new periodontal membrane*

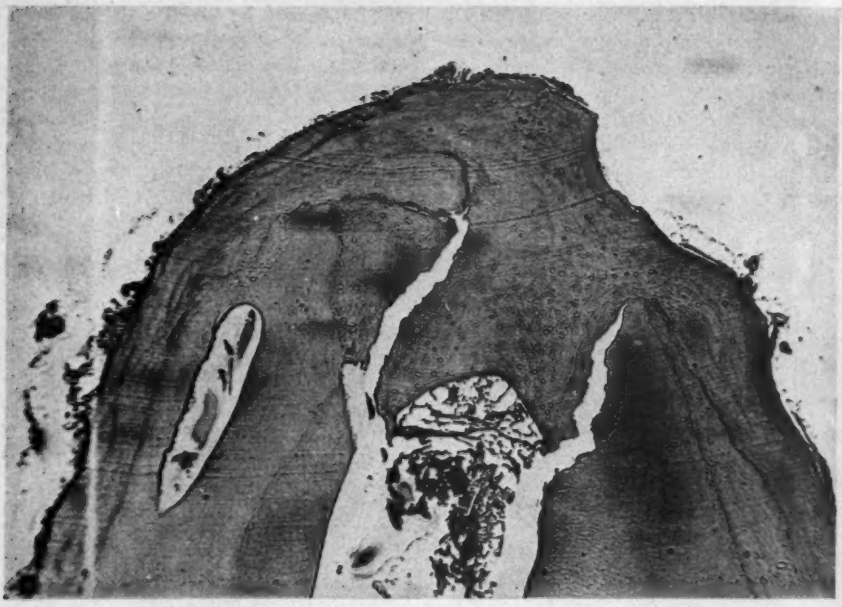


*Fig. 8 (case 4).—Photomicrograph (X 155) of upper cuspid showing repair after curettage. Entire apex is covered with new layer of cementum, reaching down into the canal and deposited against the filling material. Entire region is covered with new periodontium. Twenty-five years of service*

much easier and more successful than trying to insert a powder.

There is no supporting logic for resection or amputation of the root unless it shows signs of absorption, which is rare in conditions one would choose to treat. In such cases the root should be curetted down until solid structure is encountered and left with a rounded surface. Amputation of the root is objectionable since it merely reduces the leverage and strength of the tooth and opens up fresh dentinal tubules.

I have no roentgenographic evidence that any of my curetted apexes have failed to fill in readily with bone and excess cementum. I use a liberal vertical incision immediately over and parallel to the long axis of the tooth (Fig. 1, left). This incision does not sever the nerve supply to the gingival tissue and cause a protracted numbness of this region, which does occur with the flap technic. One deep stitch is all that is necessary for closure as there is no muscle pull.

This immediate curettage has the advantage of shortening the number of treatments since stronger sterilizing drugs can be used in the canal without causing trouble. If some are forced through they will be removed immediately in the process of the curettage.

### Precurettage Method

For the last four years I have found it expedient and successful to reverse this method of procedure in what I designate as a precurettage. This method, which may become more acceptable as progress is made in the technic, is applicable to the following types of cases: transient or out-of-town patients, patients unable to

keep regular appointments, patients in whom an extremely large region is involved with inadequate drainage, and patients in whom the condition does not

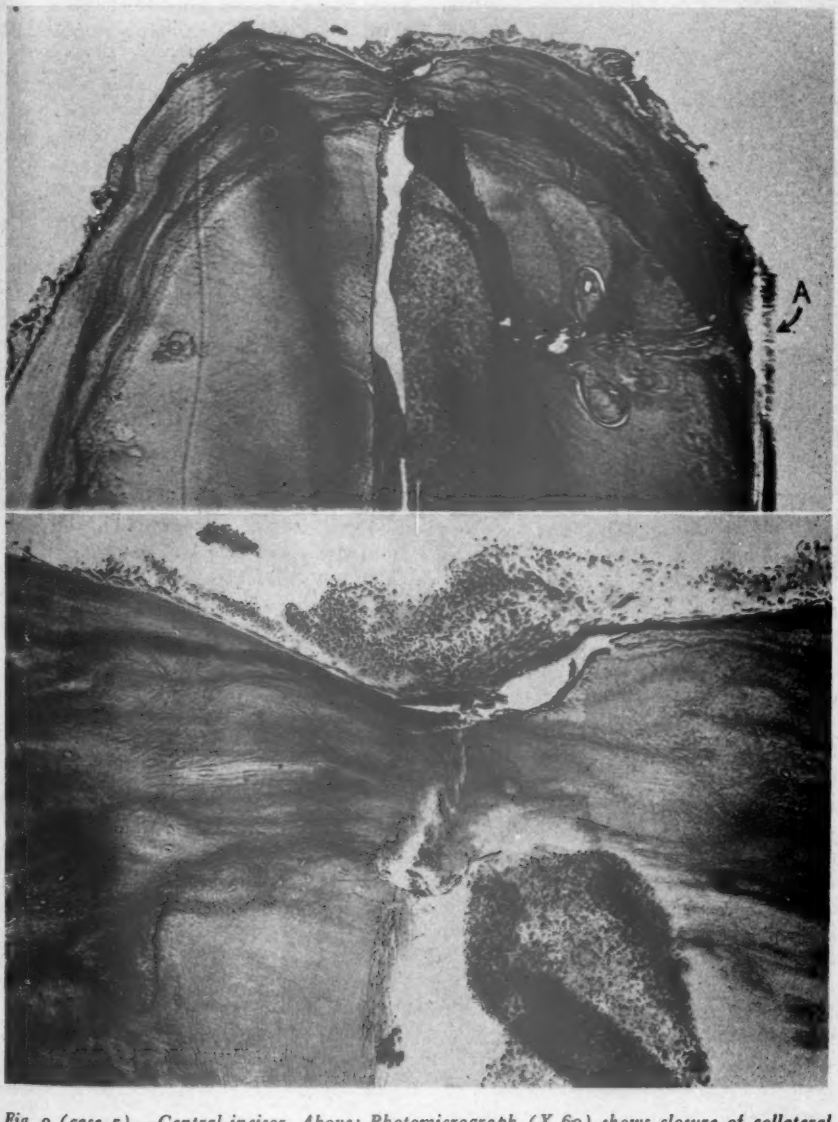



*Fig. 9 (case 5).—Central incisor. Above: Photomicrograph (X 60) shows closure of collateral canal (A) and a new cemental cap sealing the end of root. Below: Photomicrograph (X 200). Entire end was curetted down to the top of root filling, which appears black because of being misplaced and out of focus. Entire apical end is covered with a thick layer of new cementum and periodontium. Twenty-five years of service*

*Fig. 10 (case 6).—Roentgenogram of upper second bicuspid filled in 1920*

yield readily to orthodox treatment.

Before the root filling is inserted, curettage is performed by means of the following procedure: Make the incision, following the long axis of the tooth, as previously described. Thoroughly clear the region of all granulomatous tissue and necrotic bone. Freshen the cementum covering the portion of root extending into this region carefully by scraping. Smooth off the end of the root slightly, using care to avoid going through the normal cementum. In making the window through the buccal or labial plate, trim back all overhanging margin of bone and leave the area smooth to facilitate healing when surgical treatment is completed.

Pack tightly with dry, sterile, narrow, selvaged gauze after the preliminary hemorrhage has been checked. After the canal has been opened and reamed to the desired size, apply a rubber dam with the usual precautions of external sterilization. With paper points thoroughly remove all debris from the the canal, using peroxide to boil out any blood or other contents. Thoroughly cleanse and dry the canal (remember, the apical end of this tooth is embedded in dry, tightly packed gauze).

Then sterilize the root canal with phenolsulfonic acid, pumping it through the end of the root into the gauze. After this has been allowed to remain a few seconds, remove the excess with paper points and neutralize with sodium bicarbonate. Wash with alcohol and dry with a paper point; then fill according to the Callahan method, using rosin and chloroform and gutta-percha points. Overfill and pack tightly. After removing the rubber dam, carefully take out the gauze and whatever excess root filling protrudes from the apex. Scarify the inside of the cavity to induce a slight hemorrhage, place in the sulfanilamide and stitch as previously described.

## Report of Case

Various authors have directed attention to the reaction of periapical tissues to root curettage. It has been shown by the work of Boulger,[7] Bauer,[8] Kronfeld,[1, 2] Coolidge[3] and Aisenberg[9] that new functional periodontal membrane with a physiologic attachment of the connective tissue to the root end is sometimes formed.

The following case of the author, which was previously reported by Hill,[4] offers additional evidence that new at-

7. Boulger, E. P., Histologic Studies of a Specimen of Fractured Roots. *J.A.D.A.* 15:1778 (September) 1928.

8. Bauer, W., Mikroskopische Befunde an Zähnen und Paradentien nach Experimenteller Wurzelspitzenamputation unter besondere Berücksichtgung der Bedeutung funktioneller Auswirkung. *Ztschr. f. Stomatol.* 23:122 (February) 1925.

9. Aisenberg, M. S., Root Resection After Four Years: Report of a Case. *J.A.D.A.* 18:136 (January) 1931.

tachments to teeth may be built after surgical treatment.

The tooth examined was an upper right second bicuspid removed from a woman, 31 years of age. The patient was treated on November 23, 1923 after death of the pulp from caries beneath the edge of a gold crown (Fig.

*Fig. 11 (case 6).—Tooth extracted in 1939 after nineteen years of service, in process of reconstructing mouth. New cementum covering entire end of root (X 200)*

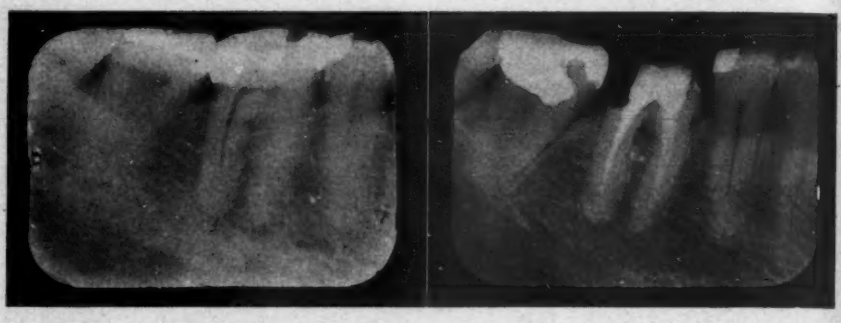


*Fig. 12 (case 7).—Roentgenograms of molar. Left: Putrescent pulp before treatment and filling in 1925. Right: Tooth was extracted in 1940 because patient was afraid of infection and preferred a bridge*

2, A). The pulp was removed with the patient under anesthesia produced by procaine hydrochloride, and a dressing of eugenol was placed in the tooth. Three days later (November 26), the dressing was removed, and fresh eugenol was substituted. On November 28, the root was filled with rosin, chloroform and gutta-percha, and a porcelain jacket crown was placed on the tooth (Fig. 2, B).

On January 14, 1924, an incision was made in the buccal mucosa, and the apical end of the root was exposed. Thickened periodontal membrane at the apex of the root was removed, and the cementum was curetted (Fig. 2, C). Care was taken not to curet through the cementum or to leave sharp edges of tooth or bone. The incision was immediately sutured over a fresh blood clot.

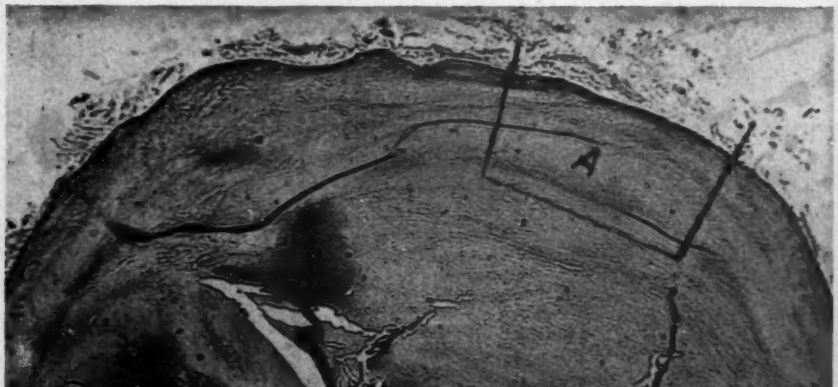



*Fig. 13 (case 7).—Tip of mesial root*

*Fig. 14 (case 7).—Above: Magnification (X 230) of A in Figure 13. Fifteen years after filling. Beautiful construction of new cementum and periodontium. Root was not curetted. Below: Tip of distal root*

*Fig. 15 (case 8).—Roentgenogram of first molar with fistula on buccal surface. The distal root was opened with phenolsulfonic acid, neutralized with sodium bicarbonate and filled with rosin and chloropercha. The mesial roots were opened with phenolsulfonic acid and neutralized with sodium bicarbonate; aromatic sulfuric acid was pumped through the fistula until it showed on surface of fistula. Then alcohol was pumped through, followed by Callahan rosin root filling until the liquid showed at opening of fistula. A mandibular injection of Monocaine Hydrochloride was given, and curettage was completed*

The tooth remained in service for four and a half years. During this time it was free from pain and functioned normally. The roentgenogram at this time shows evidence of regeneration of bone and the formation of a normal and uniform periodontal space (Fig. 2, D). Extraction was deemed advisable because of a possibility of a focus of infection. Three physicians believed the tooth was the cause of referred pain in the head and neck. In less than three weeks after the extraction of the tooth a diagnosis of exophthalmic goiter was made.

On extraction the continuity of the periodontal membrane over the apex of the root was found to be unbroken. The tooth was decalcified in 4 per cent nitric acid, sectioned buccolingually, and stained with hematoxylin and eosin. The sections show new cementum deposited over the remnants of the old cementum and new periodontal membrane attaching the tooth to its alveolus.

Figure 3 shows the side of the root at the point where the new cementum starts its attachment. All the apical end has a thick deposition of new cementum, as shown in Figure 4. The tissue covering the new cementum is comprised of connective fibers which are not embedded in the cementum as in normal periodontal membrane but are parallel to the surface of the root. Only occasional fibers, which are at an oblique angle to the root surface, are seen. That this tissue remained attached to the root on extraction is evidence of its firm attachment to the surface. A similar attachment after curettage of pyorrhea pockets was described by Box.[10]

The new periodontal membrane contained no microscopic evidence of infectious inflammation. There was no polymorphonuclear leukocytic infiltration, and bacteria are not demonstrable in sections stained with MacCallum bacterial stain. This new periodontal connective tissue was devoid of epithelial rests or any stage of proliferated epithelium. The absence of this epithelium and the resultant

10. Box, H. K., *Treatment of the Periodontal Pocket*. Toronto: University of Toronto Press, 1928.

*Fig. 16 (case 8).—Roentgenogram taken two years later shows perfect repair*

epithelial necrosis may play a prominent role in the life of this new tissue.

## Dental Consultation

In expressing my views of the relationship between the physician and the dentist, I could not improve on the remarks of Comroe,[11] an outstanding clinician of the University of Pennsylvania:

Unfortunately, most medical men have but little knowledge concerning the teeth and their disorders; however, they do not hesitate to tell the dentist which tooth must be extracted. It is hoped in the future that the dentist will be considered as a consultant and not merely as a mechanic. Frequently the physician will order extraction of all pulpless teeth in an arthritic patient despite the fact that there is no more evidence to warrant their extraction from a patient with rheumatoid arthritis than from a patient without arthritis. On the other hand, a negative roentgenogram of a pulpless tooth does not eliminate the tooth as a possible source of infection.

As Comroe suggests, dentists and physicians should enjoy an equal status as consultants. In practice, the flow of patients is back and forth between the two. Neither should be subservient to the other.

## Comment

All types of treatment, from arsenical devitalization to Monocaine Hydrochloride, and dozens of medication technics, have been used in my forty-seven years of practice. All gave the same results, a sterile tooth. However, during the entire time only one root filling was used, namely, rosin, chloroform and gutta-percha, applied by the Callahan method. The visual evidence shown in the accompanying figures, which illustrate only a few of hundreds of cases, speaks for itself.—*1815 Republic Building.*

11. Comroe, B. I., Common Mistakes in Handling Patients With Arthritis and Allied Conditions. *J.A.M.A.* 127:392 (February 17) 1945.

# TOOTH STRUCTURE AND CARIES IMMUNITY

Jacob Yardeni, D.D.S., Jerusalem

ALTHOUGH caries may seem a somewhat limited problem, the research into this disease requires a profound knowledge of many related sciences, such as chemistry, bacteriology and physics; hence, the disproportion between the prodigious amount of study that has been devoted to the nature and cause of caries and the meager results achieved. Here, I shall deal solely with the chemical and physical properties of the tooth structure and their role in caries immunity.

Alfred Kantorowicz has stated that the physiology of the enamel is limited to attrition. This may be taken as an emphasis of the accepted view that enamel is not vital, that it has no metabolism. In striking contrast to this purely mechanical conception of enamel, a conception of it as an inert structure, is the apparently surprising fact that enamel undergoes surface changes, as well as changes in its entire pattern, increasing in depth from youth to old age. As a matter of fact, functional attrition, so lightly disposed of, is not the least factor in determining these changes.

The resistance of the enamel shell must be great enough to be compatible with efficient functioning and the maintenance of a biologic relationship with its medium. Every functioning organ has some sort of compensation for increased use or illness. It is *a priori* inconceivable that the enamel should be deprived of such a mechanism.

Nature has dispensed with enamel regeneration, but the enamel nevertheless is rendered less permeable by metamorphosis, which is a not insignificant factor in caries immunity. Enamel metamorphosis, which concerns its hardness and its ability to resist caries, is evidenced by the reduced permeability of the enamel toward coloring agents, as well as by the reduced incidence of caries among persons in the advanced age groups.

As another instance of sclerotic changes, there may be mentioned the common experience that eating unripe fruits (sour apples, for example) sets the teeth "on edge," probably owing to shrinkage of the colloidal organic matter (prism sheaths and lamellae). This sensation diminishes with age, possibly on account of peripheral hornification of the organic matter or through the impregnation of enamel in general.

It is metamorphosis again which is associated with vigorous mastication. The proper use of the teeth, so ardently advocated by Wallace[1] and others because of its cleansing properties, may benefit the dentition in another way, by accelerating secondary changes of crystallization, which are normally brought about by age. This would explain the phenomenon of the sclerotic teeth of primitive people, since chemical analysis fails to reveal any tangible difference in the total percentage of minerals in fossil teeth, as compared with modern teeth. Fossil teeth should be studied for the presence and extent of the lamellae.

With regard to enamel impregnation, an observation of considerable signifi-

Read at the Fifth Palestine Dental Conference, April 1945.

1. Wallace, E. S., Some Unsolved Problems of Dentistry. *D. J. Australia* 17:1 (January) 1945.

cance was reported about twenty years ago by Mummery,[2] who observed a layer of hypercalcified enamel (homogeneously calcified transparent enamel) subjacent to a layer of enamel decalcified by caries. He considered this as evidence of a vital reaction in the enamel. This hypercalcified layer also was observed by Gottlieb.[3] Since structural variations determine resistance to bacterial invasion, this imbibition of minerals by enamel creates a second line of defense, a kind of "red light" signal, as it were, to stop the traffic of the micro-organisms into the tooth substance. Gottlieb attributed this type of hypercalcification to neither a vital reaction nor the diffusion of minerals from the saliva, but merely to a shift of minerals from the carious layer.

The old controversy, as to whence the additional minerals come, remained unsettled. Is the additional uptake only a process of the redistribution of minerals within the enamel itself? Does the medium participate in this process, providing a source of minerals? Or are there other factors in this phenomenon? It appears safe to state that the changes are twofold: (1) a physicochemical process of mineral precipitation under proper pH conditions and (2) a purely physical change in the crystalline system of the enamel prism.

A few words as to the structure, histologic, chemical and crystalline, of enamel would appear to be in order.

Under the microscope, we can discern enamel prisms and interprismatic substances, each prism extending throughout the thickness of the enamel, that is, about 0.5 mm. The thickness of each prism equals about 2-5 microns, that is, about a twentieth part of the thickness of a single hair. From the histologic point of view, the prism may be considered as the microscopic unit of enamel.

Analysis by x-ray diffraction has shown that each prism is composed of a multitude of crystals, which are beyond the microscopic vision.[4,5] The submicroscopic crystal may therefore be considered as the structural unit of the enamel. The average size of each crystallite is 0.3 microns. The crystals may be arranged in the prism at random or preferentially. Thewlis classified the enamel into three groups according to variations in the degree of regularity in the crystalline orientation. In the regular prism, the crystals are arranged at an angle of 5-10 degrees. There are prisms in which they form an angle of 40 degrees to the course of the prism; or again they may be haphazardly grouped. Chemically, the crystals are composed of molecules of hydroxyapatite ($Ca_{10}$ $[PO_4]_6$ $[OH]_2$). The word "crystal" implies an orderly arrangement of the atoms in the unit cell. Thus, the crystal is not the final unit cell of the enamel. The true building stone of enamel, that is, its chemical unit, is apatite, a complex molecule (Werner[6,7]) in which the different atoms are connected by electrovalent and covalent bonds.

The construction of a model of apatite (Mehmel[8]) may lead to a fuller understanding of the detailed reactions and changes in the enamel, which may be chemical or crystalline.

The chemical changes, in their turn, may be either reactions of decomposition or synthesis. If only a few surface atoms are removed by acids, slight decalcification results, manifested by a spot of opaque or chalky enamel, due to dis-

2. Mummery, J. H., Translucent Zones in Enamel. *Brit. D. J.* 47:473 (May 1) 1926.

3. Gottlieb, Bernhard, Dental Caries. *J. D. Res.* 23:141 (April) 1944; New Concept of the Caries Problem and Its Clinical Application. *J.A.D.A.* 31:1489 (November 1), 1598 (December 1) 1944.

4. Thewlis, J., Structure of Teeth as Shown by X-Ray Examination. London: Medical Research Council, 1940.

5. Gruner, J. W.; McConnell, Duncan, and Armstrong, W. D., Relationship Between Crystal Structure and Chemical Composition of Enamel and Dentin. *J. Biol. Chem.* 121:771 (November) 1937.

6. Werner, A., Neure Anschaungen aus dem Gebiete der Anorg. Chemie, 1909, p. 205.

7. Werner, A., Berichte. 40:4447, 1937.

8. Mehmel, M., Beziehunger Zwischen Kristallstruktur und Chem. Formel des Apatits. *Ztschr. f. Phys. Chem.* 15:223, 1931.

persion of light from a rough (submicroscopically) surface. Otherwise, complete disintegration of the molecule takes place. On the other hand, a reaction of synthesis would result in hypercalcification becoming apparent by a yellowish tone of the enamel with a sparkling luster. Mostly, these are surface changes.

With respect to mineral precipitation, an experiment by Liesegang[9] is of particular interest. Some salt of calcium phosphate was sprayed over a dish of gelatin mixed with soda, and subsequently one drop of acid added. The calcium salt in the acid zone was decomposed and wandered toward the alkaline medium (saturated with soda), where it was precipitated again in the form of the original, but much denser salt. This experiment explains the phenomenon of the dissolution of the mineral phase of the surface enamel under the influence of an acid medium and its subsequent precipitation in the adjacent acid-free layer. It explains as well the phenomenon of hypercalcification reported by Mummery and others.

This succession of acid and alkaline zones in the immediate vicinity determines the accumulation of salivary calculus on the tooth surface (on a framework of filamentous micro-organisms and desquamated epithelial cells). The normal blood serum is supersaturated with minerals (the alkaline reserve).[10] The saliva that reflects the chemical composition of the serum usually contains a surplus of minerals, in excess of its equilibrium values. Bacterial fermentation produces acids, and a part of the minerals is kept in the saliva in an ionic state. With the occasional or local reduction in hydrogen ion concentration, the surplus ions enter into a reaction of synthesis with the phosphate or carbonate radical, and precipitation takes place. The gingival margin, so rich in blood capillaries, which maintain a constant pH of 7.3 (even 8 after the carbon dioxide of saliva is given off), creates conditions for deposition of calculus.

Similarly, May Mellanby has observed that lean meat or dried milk has a definite antirachitic effect, although lean meat is a poor source of calcium.

This has been explained by the fact that phosphates and carbonates of calcium are much more soluble in solutions of amino acids than they are in water. It is suggested that amino acids might facilitate the absorption of calcium, thus becoming equivalent to food rich in calcium.

The prophylactic method of Andresen[11] and of Kraus[12] is based on a process of remineralization resulting from increased mineral concentration and the change of reaction from acid to alkaline. Andresen suggested frequent mouth-rinsing with a solution of a powder containing calcium and magnesium in a state of oversaturation. The assumption was that the calcium ion would combine with the anion radical into a complex molecule which would close the pores of enamel and prevent micro-organisms from spreading.

This is obviously a chemical defense mechanism based on impregnation from outside; but the process of metamorphosis does not stop here and does not depend solely on the protective action of the saliva. The question of the nature of enamel hardening occupied the minds of many investigators and has given place to considerable discussion. It seemed somewhat difficult to reconcile the inconsistency revealed by the lack of vitality on the one hand and the changes in the enamel on the other.

Explanations have been offered by various investigators. It has, for example, been assumed that enamel consoli-

9. Liesegang, R., Mineralisation und Remineralisation innerhalb des Zahnes. *Deutsche Zahn-, Mund- u. Kieferhlk.* 3:809 (December) 1936.

10. Holt, L. E., Jr.; La Mer, V. K., and Chown, H. B., Studies in Calcification: Delayed Equilibrium Between Calcium Phosphates and Its Biological Significance. *J. Biol. Chem.* 64:567 (July) 1925.

11. Andresen, V., Physiologic and Artificial Mineralization of Enamel. Oslo: Einal Dancke, 1929.

12. Kraus, Alfred, A New Way to Prevent Dental Caries. *Brit. D. J.* 72:105 (March 2) 1942.

dation is amenable to desiccation. This is hardly conceivable under conditions existing in the mouth, and it may be disregarded as one of the decisive factors in enamel hardening. Many investigators, such as Andresen and Pickerill, have expressed the belief that the ability of the tooth to resist decay is increased by the precipitation of minerals from the saliva. It is true that, under certain conditions, such a process actually takes place. According to Gottlieb,[8] "Normally a natural impregnation by saliva takes place." On the other hand, the evidence adduced by Karlstrom[13] points to the fact that even an unerupted tooth (before contact with saliva is feasible) revealed a higher grade of surface hardness. In his summary, Karlstrom stated (p. 162):

> It is difficult definitively to establish reasons for the variations in hardness and specific gravity shown. There are, however, good reasons for assuming that the crystals may conceivably lie more or less tightly packed or that the chemical composition differs in different layers. . . . In the completely formed enamel, there may at least under certain conditions occur processes that can be supposed to be of a metabolic nature.

One suggestion, which appears rather unusual at first sight, has been made by Williams[14]:

> There need be no embarrassment about confessing that we do not understand much about the continued hardening of cements and enamel. . . . The discovery of electrons may have given us a hint about this mystery. . . .

A word with respect to attrition: This process is apparently a waste of substance having no physiologic mechanism. It was generally assumed that the structure of enamel is established once and for all; whereas the dentin, being a vital tissue, changes physiologically. As a matter of fact, the enamel too is subject to changes in the course of time. Head asserts that "the hardening may be a sort of recrystallization within the enamel substance." Function accelerates this process.

The proper use of the teeth, apart from its being a detergent and crystallizing factor, has another advantage which relates to cusp structure: attrition reduces the height of the cusps. This is important with relation to the incidence of caries. The steeper the walls of pits and fissures, the more susceptible to decay are teeth; the shallower the cusps, the more immune the teeth.[15]

With regard to dentin, its hypercalcification can be brought about by way of calcium metabolism as a response to irritation. It may result in closure of the tubuli and in accelerated apposition on the pulpal border. The quality of the dentin has therefore some bearing on the course of caries. Although caries is initiated at the surface, in undermining caries the enamel barrier is passed through a pinhole cavity along a lamella. The enamel sometimes remains clinically intact[9, 16] until robbed of its dentinal support, when it suddenly collapses under the stress of mastication. This type of caries, the most prevalent and destructive, may be regarded as caries of the dentin rather than as enamel caries.

The specific pathways by which caries may enter the dentin are afforded by the lamellae and fissures. Recent investigations[9] intimate that the number and extent of lamellae are far more critical properties than is the degree of prism calcification. Dissolution of the dentin in undermining caries takes place before the breakdown of the enamel shell. The latter succumbs secondarily, not through decay, but by a more mechanical process.

It was originally Mellanby[17] who laid

13. Karlstrom, S., *Physical, Physiologic and Pathologic Studies of Dental Enamel.* Stockholm, 1931.

14. Williams, J. L., Can We, by a Change in Food Habits, Change the Structure of Formed Enamel So as to Make It More Resistant to Caries? *D. Cosmos* 6:590 (June) 1927.

15. Bossert, W. A., Relation Between Shape of Occlusal Surfaces of Molars and Prevalence of Decay. *J. D. Res.* 13:125 (April) 1933.

16. Pincus, Paul, Caries: Attack on Enamel Protein in an Alkaline Medium. *Brit. D. J.* 63:511 (November 1) 1937.

17. Mellanby, May, The Role of Nutrition as a Factor in Resistance to Dental Caries. *Brit. D. J.* 62: 241 (March 1) 1937.

particular stress upon the importance of calcium metabolism in the dentin as a factor in caries prophylaxis. The nutritional factor, particularly vitamin D, has a direct relation to caries immunity, and stimulation of secondary dentin has a rational basis.

Now, few assert that caries is merely a deficiency disease, or that it can be "controlled" by vitamins, if controlling means rendering the teeth immune. Mellanby[18] concluded a lecture given in Dresden (1936) with this statement:

> Many factors come into play in the origin of caries. The structure however is of cardinal importance. This is influenced by nutrition, particularly vitamin D, both in the posteruptive stage and in the period of tooth formation.

It would therefore seem illogical, or rather unbiologic, to deny the influence of nutrition on the vital dentin, its stimulation of calcium metabolism and hence its role in raising resistance. It is true that while people in Holland and peasants in Bulgaria consume the same quantity of milk products, the teeth of Bulgarians are known to be less susceptible. This is not surprising if we keep in mind that proper nutrition is only one aspect of prophylaxis. The role of mastication on the quality of the dentition has already been mentioned. Of course, the less civilized Bulgarians are more benefited by this second factor in resistance than the town folk who add ham and jam to their diet.

18. Mellanby, May, Der Ernährungsfaktor in der Kariesprophylaxe. *Deutsche Zahn-, Mund- u. Kieferhlk.* 4:1 (January) 1937.

## Summary and Conclusions

Structural resistance should be defined by various criteria.

Studies of structural variations support the validity of the opinion that enamel is subject to both chemical and physical changes, which imply increased resistance. Proper function in accelerating these changes may contribute to the phenomenon of arrested caries and caries prophylaxis in general.

The ability of the dentin to react to irritation by apposition and calcification is a vital phenomenon of which advantage should be taken. Nevertheless, even an adequate diet meeting standardized nutritional requirements, but concomitant with inadequate physical exercise of the teeth (a frequent result of malocclusion), would not appear sufficient to arrest caries, not to say reduce the rate of its development.—*Ben-Yehuda Street.*

***Scientific Advance and Social Understanding.***—Scientific knowledge has outstripped social understanding. It is generally held that man's knowledge of the physical world exceeds his understanding of human relationships, and that, consequently, he is better prepared to cope with the problems of science and technology than with the forces generated by human associations. The interrelations between the physical and social worlds, if not fully understood, may at least be observed. The experienced observer knows that the impacts of science and technology upon society are inevitable, although sometimes unpredictable. Science may remain neutral in all contests between good and evil, but this vaunted neutrality cannot determine the ends to which science may be directed. Man may dream of the potential good inherent in recent scientific discoveries. Men of evil design will not be deterred by such dreams from attempting to seize power or from employing the forces of modern science for destructive purposes. Only a broad understanding of the social implications of scientific advance and the effective use of political and other social controls can guarantee the constructive and beneficial uses of those forces.—*Harold M. Dorr. Ann. Am. Acad. Political & Social Sc.* 249: *Foreword (January)* 1947.

THE Journal OF THE
AMERICAN DENTAL ASSOCIATION

OCTOBER 1, 1947 • VOLUME 35 • NUMBER 7

LON W. MORREY, D.D.S., *Editor*

Published by the American Dental Association • 222 East Superior St. • Chicago 11, Ill.

## EDITORIALS

# COUNCIL ON DENTAL THERAPEUTICS ANNOUNCES NEW POLICY ON DENTIFRICES

THE recent recommendation of the Council on Dental Therapeutics with respect to dentifrices was approved by the House of Delegates at the Boston meeting and is reported on page 522 of this issue.

Under this new ruling acceptance will be granted by the Council on Dental Therapeutics only to those dentifrices with demonstrated therapeutic properties. This decision automatically divides dentifrices into two categories: cleansing or cosmetic dentifrices, which merely aid the toothbrush in keeping the mouth clean, and therapeutic dentifrices, for which the manufacturer claims certain medicinal or curative properties. In the future, dentifrices will be considered and evaluated in accordance with their influence on public health.

Older members of the dental profession remember vividly the extravagant and preposterous claims formerly made by some manufacturers of dentifrices regarding their products. Older members recall, too, that some dentifrices sold in the past actually were harmful to teeth and gums. As late as twenty years ago no standards were available for dentifrices, and both the public and the profession were dependent on the ability and the integrity of the manufacturer. Recognizing this deficiency, the Council on Dental Therapeutics, in 1930, developed a set of impartial and scientific standards for the composition of dentifrices and for claims which manufacturers should make for their products. Moreover, methods had to be devised which would encourage manufacturers to meet those standards. By cooperating with government, professional and consumer agencies, by lending advice and assistance to manufacturers and by developing an educational program for both the profession and the public, the Council has succeeded materially in cleaning up what once was a very unsavory situation. Most of the dentifrices available today are relatively safe for daily use.

The new program of the Council on Dental Therapeutics will enable the profession to differentiate between cosmetic and therapeutic dentifrices for the first time. Furthermore, this program will enable the members of the Council and the staff of the Bureau of Chemistry to give increased attention to strictly dental medicaments and anesthetics for which the improvement of scientific data and standards is essential.

## TENTH INTERNATIONAL DENTAL CONGRESS ESTABLISHES CLOSER DENTAL RELATIONS

THE Tenth International Dental Congress, held in conjunction with the eighty-eighth annual session of the American Dental Association in Boston August 4-8, drew dental representatives from forty-one countries. Several hundred additional dentists from foreign countries also were in attendance.

The principal purposes of the International Dental Congresses, which are sponsored by the *Fédération Dentaire Internationale,* are to stimulate better international dental relations and to develop an interchange of scientific knowledge among dentists throughout the world. Except for two occasions an International Dental Congress has been held every five years since 1889. World Wars I and II interfered with the regular sequence of meetings. Eight years elapsed after World War I before a post-war International Dental Congress was held in Philadelphia in 1926. Eleven years have elapsed since the last Congress was held in Vienna in 1936. The Congress planned for London in 1941 and the Congress that normally would have been held in 1946 were cancelled because of hostilities.

Resumption of meetings within two years after the end of the war is a record accomplishment, for which the officers of the *Fédération Dentaire Internationale* deserve the highest praise. As A. E. Rowlett, immediate past president of the *F.D.I.,* has stated: "When it is taken into consideration what has been accomplished in two years under circumstances incomparably more difficult in every way than in 1918 so that an International Dental Congress could be held this year, the progress that has been made may be described as a superb international achievement."

Dentists throughout the world can take pride in that achievement. While statesmen and diplomats are striving, with little apparent success, to reconstruct international social and economic relations, dentistry, on its own initiative and with its own resources, has made a good beginning toward reestablishing international dental relations. United by common purposes, the elimination of human suffering and the improvement of dental health, dentists recognize no international boundaries nor linguistic barriers. The exchange of knowledge among those who participated in the Congress will result in the improvement of dental health throughout the world.

The American Dental Association is proud of any part it may have had in the success of the Tenth International Dental Congress, and its members will continue to consider favorably any practical procedure that will hasten the establishment of closer international dental relations. The time has arrived when dental leaders throughout the world must consider seriously the perfection of an international dental organization that is representative of all dentists and designed for all peoples.

## HAROLD S. SMITH APPOINTED CHAIRMAN EMERITUS OF THE COUNCIL ON DENTAL THERAPEUTICS

The action of the Board of Trustees in appointing Harold S. Smith as chairman emeritus of the Council on Dental Therapeutics is one of the finest tributes ever paid by the Association to a committee chairman, a tribute that has been well earned.

It is estimated that not more than 10 to 15 per cent of the members of an association take an active interest in the affairs of the organization. In that small group there are a few members who give the most productive years of their lives to the development of a particular facet of their profession. Harold S. Smith, early in his career, became intensely interested in the affairs of organized dentistry. Perhaps his greatest contribution to his fellow dentists and to society has been his work as chairman of the Council on Dental Therapeutics, a position which he held since 1932. His concern over the chaotic condition that existed in the field of dental medicine at that time prompted him to champion the establishment of scientific standards for all dental therapeutic agents. Although his ambitions have not been fulfilled completely, the Council has made definite progress toward the goals which he established.

For fifteen years Dr. Smith has carried the responsibilities of Council affairs. The time has come when these responsibilities must be shifted to another. The Board of Trustees has wisely refused to permit Dr. Smith to become dissociated from the affairs of the Council. The action of the Board in making Dr. Smith chairman emeritus of the Council relieves Dr. Smith of the heavy responsibility which he has carried for the Association for so many years and places his experience, advice and knowledge at the disposal of his successor. The Board of Trustees not only has paid Dr. Smith a high tribute but it also has established a precedent that can be followed frequently in the future for the betterment of dentistry.

# INTERNATIONAL CORRESPONDENCE

## News from Great Britain

### Howard Mummery Memorial Prize

Every three years the British Dental Association awards the prize which commemorates one of Britain's greatest dental histologists, J. Howard Mummery. The award is made to the one who, in the opinion of the council, has published the most important paper on dentistry during the previous three years. Because of the war the awards for 1942 and 1945 were not announced at the appropriate times. Both awards have now been made. The prize for 1942 was awarded to Edgar Manley, Birmingham, for his work on the reaction of the dental pulp to filling materials. The 1945 award was made to Professor Martin Rushton, Guy's Hospital, London, for his numerous contributions on dental pathology.

### Charles Tomes Lectures

The Royal College of Surgeons of England annually honors the memory of one of its distinguished fellows who practiced dentistry, Charles Tomes. Son of the illustrious Sir John Tomes, he helped to carry forward the work, begun by his father and other pioneers, which ultimately established dentistry as a scientific profession in Britain. Two memorial lectures are delivered annually. The lecturers this year were J. G. Turner and Evelyn Sprawson. J. G. Turner, who was formerly curator of the museum of the Royal Dental Hospital, London, spoke on the movement of teeth. Evelyn Sprawson, recently retired from his position as professor of dental surgery and pathology at the University of London and as dean of the London Hospital Dental School, spoke on "Food and Feeding as They Affect the Teeth and Their Environment."

### Denture Repair Shops

During the past few years repair shops have sprung up throughout the country at a surprising rate. They offer a rapid denture repair, denture cleaning and denture remodeling service. Because no impressions are taken, it is difficult to establish that an infringement of the Dentists Act of 1921 has taken place. The Dental Board of the United Kingdom has been watchful and recently has taken legal proceedings against two proprietors of such shops. In one case the Board failed to prove the charge, but in the second it was proved that an impression had been taken and a fine of £35 ($175) and 10 guineas ($52.50) costs was imposed.

What the position of these businesses will be when the National Health Service comes into force is a question that many dentists have asked during the past months. Apparently no specific mention is to be made of them. That the profession feels that this is an omission can be seen from the following resolution passed at the joint meeting of the British Dental Association, the Incorporated Dental Society and the Public Dental Service Association held in London in June: "This meeting of the governing bodies of the three associations regrets that the Government do not intend immediately to deal with the repair shops by legislation and thus to bring to an end practices which are contrary to the best interests of the public. This meeting believes that the activities of repair shops are illegal with such small exceptions as to be negligible, but even that small exception should be made illegal by new legislation. While the meeting to some extent shares the view that the institution of the National Dental Service may hamper undesirable practices, the meeting feels that reliance ought not entirely to be placed on that effect. The meeting fears that the operation of repair shop concerns, which will inevitably be directed to continued breach of the law, may act adversely against the Service itself. The meeting fears that the public may be discouraged by these evil concerns from obtaining the full dental treatment they require and that the repair shops will endeavor to bring the National Dental Service into disrepute with the public. This meeting is strongly of the opinion, therefore, that any new bill should abolish the repair shops entirely."

### Scale of Fees Dispute

It is now estimated that about 90 per cent

of dental letters (the estimate form for treatment under the National Health Insurance Scheme) are being accepted. Thus the opposition to the scale of fees imposed by the Minister last year has virtually come to an end.

### The National Health Service

For the purpose of administering the hospital section of the National Health Service, England and Wales are divided into fourteen areas. Each area has a regional hospital board. These boards have now been set up and the following dentists have been appointed as members: Sheffield Hospital Area, G. L. Roberts, professor of dental surgery, University of Sheffield; Liverpool Hospital Area, H. H. Stones, professor of dental surgery, University of Liverpool; Birmingham Hospital Area, H. F. Humphreys, professor of dental surgery, University of Birmingham; North-West London Hospital Area, F. J. Ballard, and South-East London Hospital Area, W. Kelsey Fry.

### Tax on Toothbrushes

In the House of Commons recently Captain Baird, a dentist, moved an amendment to remove the purchase tax on toothbrushes and tooth pastes. He pointed out that toothbrushes were essential to health and that the tax was a discouragement to all who were working to better the health of the community. The financial secretary to the treasury said that to remove the tax would cost the country £1,000,000 ($5,000,000) and that he was certain that no one did not brush his teeth because he could not pay the tax. The amendment was defeated.

### Resolution of Socialist Medical Association

At a recent conference of the Socialist Medical Association, the following resolution was passed: "That it is of the utmost importance that the prejudice against conservative dental treatment should be dissipated under the new Health Service by offering dental care of the highest order. For this purpose the technical ability of dental practitioners in the Service must be of the highest degree. This Conference resolves that the Socialist Medical Association bring this matter to the notice of the Minister with recommendations for means (such as postgraduate training) by which the standard can be raised."

### Report of Ministry of Health

The recently published report of the Ministry of Health for the year ended March 31, 1946, contains many items of interest to dentists. It points out that the scale of fees for dental treatment under the National Health Insurance Scheme introduced in 1944 attempted to balance remuneration in terms of the time spent on conservation and prosthetic treatment. Conservation fees were raised by 40 per cent and fees for prosthetic treatment by 20 per cent. The report draws attention to the fact that in industrial areas the income of the dentist is dependent largely on fees obtained for dentures, and any attempt to secure a balanced remuneration for dentists in industrial practices is inopportune.

In the section dealing with maternity and child welfare, figures submitted by 128 local authorities (town and county councils) indicate that a total of 50,296 expectant mothers and 17,783 children under 5 years of age were treated by the equivalent of only thirty-nine full time dentists. For every 100 mothers treated 36 teeth were conserved and 316 were extracted, and for every 100 children treated 87 teeth were conserved and 155 extracted.

The preliminary report of an investigation of the dental condition of approximately 800 London children at twenty-six day nurseries and twenty-six resident nurseries is included. The investigation, carried out in 1944-1945, indicated that the 400 children in the residential nurseries had a lower incidence of caries than a corresponding number attending day nurseries. The percentage of children whose complete dentition was caries free was 65 in residential nurseries and 26 in day nurseries. The average number of carious or missing teeth per child was 1.2 among the long term residents, 2.07 among the short term residents and 4.6 among the nonresidents.

Mention is also made of the investigation carried out by Miss Knowles, L.D.S., on the dental condition of the children of the Channel Islands after the German occupation. Fifty per cent of the children between the ages of 3 and 7 years were caries free, and a corresponding group of children who had been evacuated to England before the occupation and had returned after the liberation of the islands showed extensive caries.—*John Boyes, University of Durham, Newcastle Upon Tyne, England.*

# A. D. A. AFFAIRS

## BOARD OF TRUSTEES WILL MEET OCTOBER 11-13 IN CHICAGO

The Board of Trustees of the American Dental Association will hold a special meeting October 11-13 in Chicago.

This meeting will be held to review and adjust the Association's budget, adopted at the Boston meeting, which is expected to show a deficit of $300,000. In accepting the out of balance budget, the House of Delegates directed the Board of Trustees to reduce expenditures to the minimum without curtailing essential activities.

The Board will also discuss plans for the eighty-ninth annual session of the American Dental Association, to be held in Chicago in September 1948.

## NEW MOTION PICTURE ON SILICATE CEMENT RELEASED

A new sound film in color entitled "Silicate Cement" has been completed at the National Bureau of Standards, according to a joint announcement by E. U. Condon, director of the Bureau, and M. D. Huff, chairman of the Research Commission of the American Dental Association.

Since 1928 the National Bureau of Standards and the American Dental Association have conducted cooperative research on the physical and chemical properties of dental materials and the proper technics involved in their use. The present film, the first of a series that will stress the clinical significance of physical properties and the importance of technic, is a result of this research.

"Silicate Cement" demonstrates two cardinal principles which must be followed to obtain good restorations. The first is to incorporate as much powder as possible into a given quantity of liquid as rapidly as possible. The second is to protect the cement from loss or gain of water before and during mixing and throughout the hardening period. The effect of technic on such critical properties as setting time, strength, shrinkage, solubility and staining is shown in a series of simple and vivid laboratory tests.

The picture, a 16-mm. film, with a running time of eighteen and one-half minutes, is available without charge to the dental profession. Information on the loan of this film can be received by writing to the Director, National Bureau of Standards, Washington 25, D. C.

## BOSTON MEETING BROADCASTS SPONSORED BY YANKEE NETWORK

Talks by dental specialists of this country and Europe attending the eighty-eighth annual session of the American Dental Association were recorded by the Yankee Network Institute for broadcast over twenty-six New England stations.

The Institute, which sponsors "Medical Center of the Air," a half-hour weekly program heard in New England, also broadcast an interview with LeRoy M. Ennis, professor of roentgenology, University of Pennsylvania, who discussed "The Importance of the X-Ray in Dentistry."

Among the speakers who participated in the first program of the convention were Col. Joseph L. Bernier, Army Institute of Pathology; P. E. Blakerby, dental director of W. K. Kellogg Foundation; Thomas L. Hagan, dental consultant for the southeastern states of the United States Public Health Service; Thomas D. Speidel, dean, School of Dentistry, Loyola University, New Or-

leans; Donald A. Wallace, secretary, Council on Dental Therapeutics, American Dental Association; Thomas J. Hill, professor of pathology and therapeutics, Western Reserve University, Cleveland, and William McGill Burns, member of the Board of Trustees, American Dental Association, and member of the executive council, Dental Society of the State of New York.

# DENTAL SOCIETIES

## IOWA STATE BOARD ANNOUNCES DENTAL EXAMINATIONS POSTPONED

The next examinations of the Iowa State Board of Dental Examiners, scheduled for October 3-9, have been postponed indefinitely, according to an announcement by Harry G. Bolks, secretary of the board.

No time can be set for the next examinations pending the appointment of a new director of licensure and registration in the State Department of Health, to succeed W. H. Grefe, who resigned recently.

## PRELIMINARY PROGRAM GIVEN FOR ILLINOIS DENTAL MEETING

The general clinic program for the eighty-third annual meeting of the Illinois State Dental Society will be held Saturday morning, October 11, at the Hotel Pere Marquette, Peoria.

Officers and committee chairmen will attend the president's dinner, Tuesday, October 7, on the opening day of the meeting. Nathaniel Leverone, chairman of the board of the Automatic Canteen Company of America, will speak at the banquet on Thursday. Dinners will be given on Friday evening by the Committee on Military Affairs and the Council on Dental Health.

Cecil H. Bliss, Sioux City, Iowa, will talk on the "Strategy of Handling Patients" at the first general session on Thursday, October 9. Other speakers scheduled for morning and afternoon sessions include Raymond L. Girardot, Detroit, who will discuss "Partial Denture Prosthesis"; Lyle F. Aseltine, Chicago, "Oral Surgery," and Kenneth A. Bignell, Chicago, "Crowns and Bridges." LeRoy E. Kurth, Chicago, will talk on the "Fundamentals in Full Denture Construction," and the subject of Walter T. McFall, Asheville, N. C., is "Practical Workable Children's Dentistry Which Pays."

The annual golf tournament of the Illinois Dental Society will be held at the Country Club of Peoria, on Wednesday, October 8. Golf and bowling prizes will be awarded at the annual sports dinner to be held on the same day.

## INDIANA DENTAL ALUMNI WILL MEET OCTOBER 3-4

The annual meeting of the Indiana University Dental Alumni Association will be held October 3-4, at Bloomington.

Stanley D. Tylman, head of the crown and bridge department, College of Dentistry, University of Illinois, and Harold Hillenbrand, general secretary of the American Dental Association, will be the principal speakers at the scientific session on Saturday morning. Herman B. Wells, president of Indiana University, will speak at the luncheon immediately after the meeting.

## NEW YORK DENTAL HYGIENISTS ANNOUNCE MEETING OCTOBER 3

The Dental Hygienists Association of the City of New York will meet October 3 at the Hotel Pennsylvania in New York City.

Miss Virginia R. Frese, of the National Institute for Human Relations, will speak on the topic, "Good Human Relations Are Good Business."

Henri Villain (left), Paris, president of the Fédération Dentaire Nationale Francaise, and Charles Roger (right), Paris, French delegate to the Tenth International Dental Congress, are shown with Sterling V. Mead, retiring president of the American Dental Association, at the Tenth International Dental Congress, which met in conjunction with the eighty-eighth session of the American Dental Association

Among the participants in the Conference of State Society Officers, Boston, August 3, 1947, were (left to right): Robert L. Borland, president-elect of the Southern California State Dental Association, who was vice-president of the Conference; William H. Crawford, dean of the School of Dentistry, University of Minnesota, and L. T. Maloney, assistant to the president of the Massachusetts Dental Society

Participants in a discussion of international dental problems over the N.B.C. network during the Boston meeting of the American Dental Association were (left to right): A. E. Rowlett, president of the Fédération Dentaire Internationale; Sterling V. Mead, retiring president of the American Dental Association; N.B.C. announcer; H. B. Washburn, incoming president of the American Dental Association, and Philip E. Adams, chairman of the Committee on Local Arrangements

Above: Awarding of the Georges Villain Prize and the Miller Prize by the Fédération Dentaire Internationale at the Tenth International Dental Congress in Boston, August 4-8, 1947. Left to right: Henri Villain, brother of Georges Villain, the late president of the F.D.I.; Allan G. Brodie, dean of the College of Dentistry, University of Illinois, recipient of the Villain Prize; Mrs. D. L. La Chance, daughter of the late William H. G. Logan, who was awarded the Miller Prize posthumously; A. E. Rowlett, president of the F.D.I., and Juan V. Carrea, dental scientist of Buenos Aires, Argentina, winner of the Miller Prize

Lower left: Winners of the 1947 Junior Prize Essay Contest sponsored by the American Dental Association were (left to right): Herman J. Lyn, Chicago College of Dental Surgery, School of Dentistry, Loyola University; Donald James Passmore, Dental School, University of Oregon, and Bert W. Gilbert, School of Dentistry, Indiana University

Lower right: Chesan Lung (right), head of the Department of Dentistry at the Central Hospital, Nanking, China, and Eric Shao-Wu Chee, of Chengtu, Szechwan, China, secretary of the National Chinese Dental Health Board, at the Tenth International Dental Congress, Boston

*First Gold Certificate Awards Given By Oklahoma State Dental Association*

*The seven dentists to whom the gold certificate and gold key award designating fifty years of service were presented at the fortieth annual meeting of the Oklahoma State Dental Association were (left to right) Frederick C. Seids, Perry; Frederick D. Sparks, Ponca City; R. H. Pendleton, Norman; T. H. Williams, Chickasha; C. S. Ferner, Tulsa, and C. I. Trimble, Tulsa, and, not pictured, W. S. Williams, Durant*

## SEVEN OKLAHOMA DENTISTS RECEIVE GOLD CERTIFICATES

Seven members of the Oklahoma State Dental Association were honored at the first presentation of the gold certificate and gold key award, commemorating fifty years of practice in dentistry, held during the fortieth annual meeting of the association, April 13-16, in Oklahoma City. A. B. Walker, Norman, past president, made the presentation.

The recipients of the award were T. H. Williams, Chickasha; W. S. Williams, Durant; Frederick C. Seids, Perry; Frederick D. Sparks, Ponca City; R. H. Pendleton, Norman; C. S. Ferner, Tulsa, and C. I. Trimble, Tulsa. All seven dentists originally were members of the Oklahoma Indian Territorial Society, and, after Oklahoma's admission to statehood in 1907, joined the newly formed Oklahoma State Dental Society, which later became the Oklahoma State Dental Association.

## DETROIT DISTRICT SOCIETY HOLDS SIXTH ANNUAL REVIEW

The Detroit District Society will hold its sixth annual review at the Hotel Statler, Detroit, on November 3-4.

Principal speakers on the program are Kurt H. Thoma, Boston, who will discuss "The Diagnosis of Oral Surgical Diseases," and W. Harry Archer, Pittsburgh, who will read an essay on "Oral Surgery."

The review will include sixteen limited attendance clinics. Table clinics will cover the subjects of dentistry for children, root canal therapy, amalgams, photography, gold inlays, full dentures, partial dentures, periodontia, orthodontics, acrylics and crown and bridge prosthesis.

## ACADEMY OF DENTAL MEDICINE ANNOUNCES NEW YORK MEETING

The American Academy of Dental Medicine will hold a luncheon meeting and round table discussion prior to the Greater New York Dental Meeting on Sunday, December 7, at the Hotel Pennsylvania.

All members and dentists and physicians who are interested are invited to attend. Communications should be addressed to William M. Greenhut, secretary, 124 East Eighty-Fourth St., New York.

At a recent meeting of the Academy, the following officers were elected for 1947-1948: Sidney Sorrin, president, J. Lewis Blass, president-elect, and William M. Greenhut, secretary, all of New York; George A. Bruns, Revere, Mass., treasurer, and Allan N. Arvins, New York, editor.

# WORLD DENTISTRY

## INDIA TRAINS FUTURE DENTAL TEACHERS IN UNITED STATES

Thirteen candidates have been selected by the government of India for postgraduate training in various dental colleges throughout the United States, N. N. Bery, honorary secretary of the All-India Dental Association, announced on a recent visit to the central office of the American Dental Association in Chicago.

All of the students are under a contract to serve the Indian government as teachers for a period of five years after their training in this country. This plan of sending postgraduate students will be in operation for the next five years, Dr. Bery said.

A list of the candidates, their subjects and placement follows: Capt. Mahmud Ahmed, prosthetic dentistry, Baltimore College of Dental Surgery, University of Maryland; Sg./Lieut. M. R. Vig, orthodontics, Tufts College Dental School, Boston; Capt. Hasan Raza Shah, dental histology, pathology and bacteriology, College of Dentistry, University of California; Ijaz-ul-Haque, prosthetic dentistry, College of Dentistry, State University of Iowa; Capt. Balwant Singh Kochar, oral surgery, School of Dentistry, Temple University; Capt. Harbane Singh Puri, dentistry for children (college not given); Capt. M. K. Sanjana, operative dentistry, Baltimore College of Dental Surgery, University of Maryland; Capt. Hirendra Nath Bose, operative dentistry, College of Dentistry, State University of Iowa; Capt. M. G. Rao, prosthetic dentistry, College of Dentistry, University of California; Capt. C. M. Ali Beg, prosthetic dentistry, Dental School, University of Oregon; D. D. Watts, preventive and operative dentistry, Dental School, Northwestern University; Balraj Vachar, dentistry for children and orthodontics, and George Patnaik, operative dentistry (colleges not stated).

## D. A. KEYS PRESENTS DENTAL LECTURES IN SCANDINAVIA

Donald A. Keys, chairman of the department of operative dentistry, College of Dentistry, University of Nebraska, on the invitation of the national dental associations of the Scandinavian countries, began a series of lectures, August 23, for members of the profession in Norway, Sweden and Denmark.

Dr. Keys planned a five-day program in the capital of each country. His lectures, designed to serve as "refresher courses," helped bring dentists in these countries up to date on recent American developments in dentistry. The talks were illustrated with color motion pictures and slides which Dr. Keys had prepared.

Before his return to the United States late in September, Dr. Keys visited members of the American Dental Society of Europe in the Netherlands, Belgium, France, Switzerland and England.

## ONTARIO RED CROSS SPONSORS TRAVELING DENTAL SERVICE

Children in remote sections of Ontario, Canada, whose teeth are being neglected because no dentists are available, are benefiting through a free service given by the Ontario Division of the Canadian Red Cross Society.

Stewart A. MacGregor, chairman of the dental committee, stated that the division purchased and completely equipped a dental coach, which will cover an area from Perry Sound to Georgian Bay and the town of Bala. Murray Buchman has been appointed the dentist in charge. The Red Cross service is intended for children of school and preschool age in outlying parts of the province.

Junior Red Cross and nutrition services of the Red Cross have aided in this health project. Through the Junior Red Cross, the program was outlined to school inspectors, who, in turn, distributed cards requesting the consent of parents to the service. Red Cross nutritionists give lectures on nutrition to parents in the area as part of the program.

The new traveling dental service commenced in May at Sundridge, Ontario.

## NEW DENTAL AND MEDICAL JOURNALS START PUBLICATION

Several new dental publications have appeared in recent months. In addition to the dental news weekly, *Bronce,* Republic of Colombia, the American Dental Association has received first copies of the *Queensland Dental Journal,* Australia; *Revista de la Asociatión Odontológica del Peru* and *Revista de la Sociedad Peruana de Protesis Dental y Maxilo Facial,* Lima, Peru; *Odontostomatological Progress,* Athens, Greece; *Radiology,* Section XIV of *Excerpta Medica,* Amsterdam, Holland; *Actualités Odonto-Stomatologiques* and *Art Dentaire,* Paris, France.

## MEXICAN DENTAL ASSOCIATION ELECTS OFFICERS FOR 1947-48

The board of directors of the *Asociacion Dental Mexicana,* recently elected for the coming year, will include Felix del Paso, president; José Escamilla Andueza, vice-president; Enrique C. Aguilar, secretary; Fermin Reygadas, treasurer, and Pedro Villalon and Roberto Ruff, assistant secretaries. Other members of the board are Roman S. de Lascurain, Eugenio Vargas Tovar and José del Rivero Gual.

# DENTAL EDUCATION

## MAXILLOFACIAL SURGERY COURSES OFFERED AT ILLINOIS

Four-week, full time refresher courses in maxillofacial surgery will be offered four times within a period of eight months by the College of Dentistry, University of Illinois.

Isaac Schour, associate dean in charge of postgraduate studies, has announced that the first course will be offered on November 10. Succeeding classes will convene on February 16, May 3 and July 6, 1948.

The course has been designed primarily for the general practitioner and will consist of didactic and clinical instruction. The didactic work will cover the essentials of maxillofacial surgery.

Dr. Schour said that each student will participate in the minor oral surgery clinic. The more difficult cases will be demonstrated by the faculty of the College of Dentistry.

Bernard G. Sarnat, acting head of the department of oral and maxillofacial surgery, will head the faculty for the course. Eli Olech, Henry J. Droba and E. Lloyd DuBrul also will instruct the classes.

Registration will be limited to four students in each class. The course will be offered under the G.I. Bill of Rights.

## RETIREMENT OF DEAN BYRNES AND M. D. HUFF ANNOUNCED

Goodrich C. White, president of Emory University, Atlanta, Ga., has announced the retirement of Ralph R. Byrnes, dean and professor of operative dentistry, and that of M. D. Huff, secretary of the faculty and professor of materia medica, from the staff of the School of Dentistry.

Their retirement will become effective at the end of the academic year 1947-1948. Dr. White, in his announcement to the members of the faculty, recommended that the emeritus relationship be given to Dean Byrnes and Dr. Huff on their retirement. He stated that no decision had been made concerning Dean Byrnes' successor.

In addition to his present post as dean and professor of operative dentistry, Dr. Byrnes has served as a member of the Advisory Council of the School of Dentistry, Emory University, since 1944, and from 1926 to 1944 as trustee before the Atlanta-Southern Dental College merged with the university. He became a member of the staff of Atlanta-Southern Dental College in 1920 and held in succession the posts of vice dean, executive dean and dean.

Dr. Huff has been on the faculty of Southern Dental College, the Atlanta-Southern Dental College and the School of Dentistry, Emory University, continuously since 1901. He has been professor of materia medica and therapeutics since 1905. Dr. Huff was also a member of the Executive Committee and the Board of Trustees of the Atlanta-Southern Dental College and is now secretary of the Advisory Council of the School of Dentistry, Emory University.

*Ralph R. Byrnes, dean and professor of operative dentistry, who has announced his retirement from the faculty of the School of Dentistry, Emory University in 1948*

*M. D. Huff, secretary of the faculty and professor of materia medica, who will retire from the School of Dentistry, Emory University, at the same time as Dean Byrnes*

Both Dean Byrnes and Dr. Huff were elected Fellows of the American College of Dentists and Honorable Fellows of the Georgia State Dental Society. Dr. Huff has been chairman of the Research Commission of the American Dental Association for the past nine years, and he held the office of third vice-president of the Association for the term 1946-1947.

Dean Byrnes served as president of the American Association of Dental Schools, 1936-1937, and as president of the Pan American Odontological Association, 1943-1944. During World War II, he was a lieutenant commander in the U. S. Navy, Reserve Dental Corps.

### LESTER G. HIGLEY RECEIVES GRINNELL COLLEGE AWARD

Lester G. Higley, professor of orthodontics, College of Dentistry, State University of Iowa, was one of three alumni of Grinnell College who were honored by the Grinnell College Alumni Association last June. The honor, an award for distinguished service, was conferred in connection with the 101st anniversary celebration of the college.

Dr. Higley is nationally known as a lecturer, research worker and author in the field of dentistry.

### ALLAN G. BRODIE NAMED DEAN OF DENTISTRY AT ILLINOIS

Allan G. Brodie, Park Ridge, Ill., has been appointed dean of the College of Dentistry, University of Illinois, A. C. Ivy, vice-president of the university for the Chicago professional colleges, has announced.

Dr. Brodie has served as acting dean of the College of Dentistry since the fall of 1944. He has been a member of the faculty of the professional colleges since November 1929, when he organized the department of graduate orthodontics.

Dr. Brodie, a native of New York City and a graduate of the University of Pennsylvania, established the principle of the constancy of the growth pattern of the face. He recently won the Miller Prize for his work in orthodontics.

## ARMY AND NAVY

### NAVAL RESERVE DENTISTS WELCOMED AT GREAT LAKES

Twenty Naval Reserve dentists from cities throughout the Ninth Naval District recently were welcomed to the Great Lakes Naval Training Center by Rear Admiral J. Cary Jones, Commandant of the Ninth Naval District, for two weeks of Naval Reserve active duty training.

Participating in the welcoming ceremonies were Capt. Merrill Comstock, Deputy Commandant and Chief of Staff; Capt. W. P. Caruthers, District Dental Officer; Capt. F. Monroe, District Director of Training, and Cmdr. Walter W. Dalitsch, Reserve Dental Liaison Officer for the Ninth Naval District.

The course of study included visits to dental and medical establishments in the Great Lakes vicinity, motion pictures, and lectures and discussions on the organization and function of the Dental Corps in the regular Navy and the Naval Reserve.

### S. D. TYLMAN NAMED DENTAL CONSULTANT AT ARMY HOSPITAL

Stanley D. Tylman, professor of prosthetic dentistry, College of Dentistry, University of Illinois, has been appointed as expert civilian consultant in dentistry to Percy Jones Hospital at Battle Creek, Mich.

The appointment was made from the office of the Surgeon General, Washington, D. C.

Dr. Tylman has been working with flexible plastics for more than six years and was the first to use them in the

*Commandant Welcomes Reserve Dentists at Naval Training Center*
*Shown are twenty Naval Reserve dentists who were welcomed at the Great Lakes Naval Training Center by Rear Admiral J. Cary Jones, Commandant of the Ninth Naval District*

construction of artificial ears, noses and fingers. During World War II, he trained army and navy personnel to do restorative work on disfigured servicemen.

A member of the faculty of the College of Dentistry at the University of Illinois since 1920, Dr. Tylman also is recognized for his work in the field of bridge and crown prosthesis.

## DENTAL CORPS OFFICERS PARTICIPATE IN ARMY RESEARCH

A program of dental research, in which Army Dental Corps officers will participate, was inaugurated on May 1, 1947, when Capt. George W. Burnett began a year's course of study at the School of Medicine and Dentistry, University of Rochester, Rochester, N. Y.

Under a contract entered into between the Army Medical Research and Development Board and the University of Rochester, this school is sponsoring the dental research program for Army Dental Corps officers.

As part of the program an investigation of the bacteriologic and biochemical aspects of dental caries is being conducted in the departments of bacteriology and dental research. This study is directed by George P. Berry, professor of bacteriology, and J. E. Gilda, senior fellow in dentistry. The research will be carried on in close cooperation with Basil G. Bibby, director of the Eastman Dental Dispensary.

Captain Burnett, the first dental corps officer designated to participate in the program, served in the Army Dental

Corps from 1943 to 1946, and re-entered the military service in January 1947 to accept his appointment in the Regular Army. He received the Bachelor of Arts degree at Texas Technological College in 1937 and earned a Master of Arts degree in physiology at the University of Texas in 1940. He received the degree of Doctor of Dental Surgery from the School of Dentistry, Washington University, in 1943.

Selection of additional qualified dental corps personnel is planned for training in other fields of dental research having military application.

### NAVY PLANS SPECIAL TRAINING FOR RESERVE DENTAL OFFICERS

The United States Naval Dental School, National Naval Medical Center, Bethesda, Md., has scheduled two periods of special training duty for Naval Reserve dental officers who have returned to civilian life.

The first period, October 6-18, will be devoted to special training on ocular prosthesis. Since dental officers of the Naval Reserve on inactive duty may in the future be called on to do ocular prosthesis for military personnel, it is felt that this training will enable them to serve the civilian population in peace as well as to prepare themselves better for treatment of military forces in time of emergency.

The second period, October 27 to November 8, will be given over to training especially designed to acquaint reserve dental officers with recent progress in naval dentistry and to familiarize them with typical Navy and Marine Corps organizations.

The capacity of the Naval Dental School with respect to this training is limited. Accordingly, the total number which can be accommodated is being apportioned among the naval districts. No quotas are assigned to the eleventh, twelfth and thirteenth naval districts, because of the limitation of travel funds.

A request for assignment to either of the periods of training duty mentioned above should be submitted to the commandant of the naval district in which the reserve officer maintains his official residence.

## PUBLIC HEALTH

### DENTAL SECTION PROGRAM FOR A.P.H.A. MEETING ANNOUNCED

The Dental Section of the American Public Health Association is planning two half-day individual sessions and one joint session for the seventy-fifth annual meeting of the association, October 6-10, in Atlantic City, N. J., according to an announcement by Allen O. Gruebbel, secretary of the Council on Dental Health of the American Dental Association.

The first half-day session will be devoted to a research symposium of the dental projects operating in various parts of the country on the subject of dental caries. Five essayists will take part in the discussion.

The second half-day session will have four speakers of general information covering such fields as observation of the United Nations dental program in Europe, observation of the Swedish dental program, allocation of funds for dental care and newer methods of community approach in the dental field.

The joint session will be held with the American School Health Association.

### C. E. PRESNELL NAMED MISSOURI STATE DENTAL HEALTH DIRECTOR

Confirmation of the appointment of Charles E. Presnell, St. Louis, as director of the Missouri state dental health program, effective July 15, has been announced by D. W. Brock, chairman of the Council on Dental Health, Missouri State Dental Association.

Dr. Presnell has been associated for the past year with the dental hygiene program of the St. Louis public schools, under the direction of A. E. Murphy, also formerly associated with the state program. He discontinues an active practice of orthodontics to assume his state position.

Graduated from Westminster College in 1930 with a Bachelor of Arts degree, Dr. Presnell received the degree of Doctor of Dental Surgery from St. Louis University in 1937. In 1939 he was awarded the Master of Science degree in hygiene and public health at the University of Michigan, where in 1945 the degree of Master of Science in orthodontics was also conferred upon him.

### KANSAS HEALTH BOARD CONDUCTS STUDY ON FLUORINE TREATMENT

The Division of Dental Hygiene of the Kansas State Board of Health has announced the completion of a study by G. M. Hassur, of the division staff, on the time required to treat teeth with topical applications of fluorine. The study was made in connection with the new service made available July 1 by the Division of Dental Hygiene. This service consists of offering a 2 per cent aqueous solution of sodium fluoride without charge to Kansas dentists on request.

The study was made to determine the time required for topical application of fluorine for the average patient in a one chair dental office and to gather data on tardiness and failure to keep appointments. Thirty children, between the ages 3 and 16, of Kansas State Public Health Department employees were the subjects. The technic used was that recommended by the U. S. Public Health Service. Thirty minutes was allowed for the first appointment which included a prophylaxis and treatment. Fifteen minutes was allowed for each succeeding appointment. The operator worked with no assistant.

Twenty-three children received five treatments each. Four children received four treatments each. On twenty-four occasions, children failed to keep their appointments. On ten occasions, children were tardy for appointments. As a result of this study, the Kansas Division of Dental Hygiene concludes that thirty minutes should be allowed for the first appointment and fifteen for each succeeding appointment, when patients are treated individually. Two children can be treated simultaneously in approximately twenty-six minutes. With an assistant to isolate and dry the teeth, a greater number of patients can receive treatment in the same period of time. Because of the number of broken appointments, recall of patients by telephone or post card is recommended.

## VETERANS

### REPLACEMENT DUE FOR GENERAL BRADLEY AS VETERANS CHIEF

Gen. Omar N. Bradley, Administrator of Veterans Affairs, is slated to succeed Gen. Dwight D. Eisenhower as Army Chief of Staff, after the completion of General Bradley's six weeks' tour of American outposts in Europe, which began August 15.

President Truman and his administration leaders are reported to be searching for a man to carry through reforms in the Veterans Administration initiated by General Bradley. Assisted by Maj. Gen. Paul R. Hawley, chief medical director of the agency, General Bradley is credited with making valuable improvements in all departments. Leading dentists, physicians and the larger schools of the professions now participate in the program.

The Veterans Administration has more than 200,000 employees. Although Congress stressed economy in appropria-

tions, the agency will have $20,000,000 more than Mr. Truman requested for the medical and hospital departments. However, the administrative staff must be reduced.

### VA REPORTS DENTAL STUDY UNDER REHABILITATION ACT

Nearly 1,000 disabled veterans are taking courses leading to degrees as Doctors of Dental Surgery, under the Vocational Rehabilitation Act (Public Law 16), the Veterans Administration has announced.

The figure was arrived at in a 79 per cent sampling of the records of some 229,000 handicapped ex-service men and women in schools and on-the-job training courses on May 1.

In addition to the 983 students in dental colleges, 2,626 other disabled veterans are in training as laboratory technicians. Of these, 1,396 are in colleges and universities; 1,230 are in other educational institutions at the noncollege level, and 978 are taking on-the-job training.

Veterans with service-connected disabilities are eligible for education and training under Public Law 16 if they require such training to restore their employability.

### SLIGHT DELAY REPORTED FOR G.I. STUDENT BENEFITS

The Veterans Administration is completing plans to speed up benefits for the 1,325,000 veterans of World War II expected to enroll in colleges and universities this fall.

The anticipated enrollment will set a new record of at least 10 per cent over the previous high enrollment of 1,209,000 last April and will tax the facilities of the Veterans Administration in qualifying the veterans for subsistence allowances.

Although no serious delays in payment of subsistence allowances are anticipated, the Veterans Administration is advising student-veterans to be able to meet personal financial obligations for at least the first six weeks of the fall term.

In most cases, the veterans should receive their first allowance check early in November, if they enroll properly and if the institution certifies their enrollment to the Veterans Administration promptly.

## GENERAL NEWS

### TESTIMONIAL DINNER PLANNED TO HONOR M. HILLEL FELDMAN

M. Hillel Feldman, chief of staff of the Dental Clinic, Lincoln Hospital, New York, will be honored by the staff of the hospital's dental service at a testimonial dinner, October 25, at the Plaza Hotel, New York.

Dr. Feldman, who has specialized in oral surgery for thirty years, founded the dental service at Lincoln Hospital in 1917. At the same time, he inaugurated the first dental internship without financial compensation, on the same basis as medical internships.

In 1914 he founded the Northern Dental Society and later served as its president after it became known as the Bronx County Dental Society of New York State.

In addition to his many other contributions to dentistry, Dr. Feldman is known for his textbook, *Exodontia,* which presents his technic eliminating the use of chisel and mallet on bone in extraction of teeth.

Those wishing further information on the testimonial dinner to be given for Dr. Feldman are asked to write to M. O. Balaban, 161 West Fifty-Fourth St., New York 19.

### DENTAL PUBLICATIONS ASKED FOR DISTRIBUTION IN EUROPE

A request for textbooks, journals, charts and reprints to aid physicians and dentists in Europe has been received by

the American Dental Association.

Dentists who wish to send copies of THE JOURNAL or other material for this purpose should address their contribution to the SOS Collection of the Joint Distribution Committee, 1539 Troy Ave., Vandeveer Park, Brooklyn, N. Y.

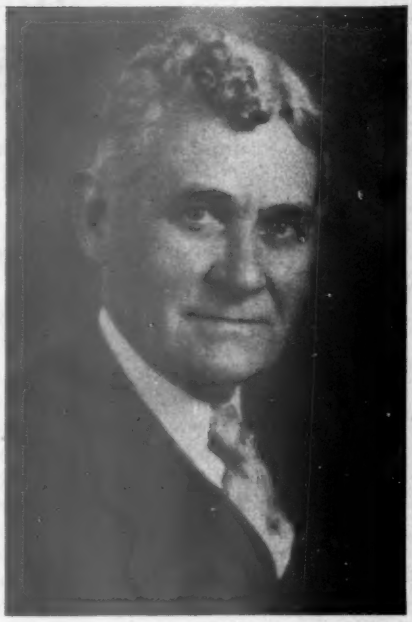
## SHEPPARD W. FOSTER, PIONEER DENTAL EDUCATOR, DIES AT 86

Sheppard W. Foster, St. Petersburg, Fla., a past president of the American Dental Association and president of the Atlanta-Southern Dental College from 1917 to 1944, died on August 16 at the age of 86.

Dr. Foster was born in Little Oak, Ala., June 11, 1861, and was graduated from Vanderbilt University Dental School with honors in 1887, with the degree of Doctor of Dental Surgery.

In 1895 Dr. Foster accepted the position of dean of the Southern Dental College, and in 1917, when the Atlanta Dental College and the Southern Dental College combined, he was elected to the presidency of the newly-formed Atlanta-Southern Dental College. When the Atlanta-Southern Dental College was absorbed by Emory University in 1944, Dr. Foster retired as president emeritus of the dental school and shortly after went to Florida to live because of his gradually failing health.

Dr. Foster achieved a nationwide prominence for his work in various dental organizations. In 1897, while serving as secretary of the Southern Dental Association, he assisted in bringing about its union with the American Dental Association, forming the National Dental Association. The association later became known as the American Dental Association, and Dr. Foster was elected president in 1926. During his presidency of the American Dental Association, Dr. Foster presided over the World Dental Congress, held in Philadelphia.



*S. W. Foster Dies at 86*

*Sheppard W. Foster, president of the American Dental Association in 1926-1927 and president of the Atlanta-Southern Dental College from 1917-1944, died in St. Petersburg, Fla., August 16, at the age of 86*

Dr. Foster was also a member of the Board of Trustees of the American Dental Association from 1923 to 1932 and of the Dental Educational Council of America from 1914 to 1932. He was secretary of the Alabama Dental Association, 1892-1894; president of the National Association of Dental Faculties, 1904-1905; president of the Southern Branch of the National Dental Association, 1913-1914, and president of the Georgia Dental Association, 1925-1926. The honorary degree of fellow was conferred on him by the American College of Dentists in 1921, and the previous year the Georgia Dental Association conferred on him an honorable fellowship in the society.

## COUNCIL ON DENTAL THERAPEUTICS

# NEW POLICY ON DENTIFRICES ANNOUNCED BY COUNCIL

THE Council on Dental Therapeutics of the American Dental Association has been an outstanding pioneer and influence in the evaluation and improvement of dentifrices for seventeen years. In 1930, when the Council initiated its program, the need for impartial and scientific standards in the field of dentifrices was acute. The Council, by establishing standards for composition, by delineating the claims which could be made and by encouraging the use of acceptable dentifrices, has made substantial contributions to oral and public health. Largely as a result of the efforts of the Council, therefore, most of the dentifrices available today are relatively safe for daily use.

In view of the distinct advances that have already been made and in keeping with its policy of constantly revising its program in order to reflect current professional and scientific opinion, the Council on Dental Therapeutics has concluded that additional progress can be made more rapidly by placing maximum emphasis on other phases of its long-range program regarding dentifrices. In order to accomplish such progress, the Council will discontinue the consideration of cleansing dentifrices with a view to their acceptance. The Council, however, will continue to evaluate such products and to encourage sound formulation and honest claims in order to advance the improvements that have already been made. In the future, too, the Council will give particular attention to dentifrices for which therapeutic claims are made, since the development of new drugs makes the appearance of many new products in this field quite probable.

The decision to discontinue the consideration of cleansing dentifrices with a view to their acceptance was taken by the Council after a serious study of all conditions in this area of its work. Cleansing dentifrices are essentially scouring agents, and this function can be performed quite satisfactorily for most people with a mixture of finely powdered salt and baking soda. As a result, the Council did not feel that the granting of a Seal of Acceptance would continue to have the same value in the field of dentifrices that it does in the more important fields of local anesthetics and other dental therapeutic agents.

The unsound and undignified advertising claims so frequently made in this highly competitive and commercial field will, no doubt, continue to be of concern to both the public and the profession. The increasing vigilance of the two federal agencies concerned with such products and their claims should eventually ensure proper safeguards through formal governmental action. The Federal Trade Commission, the Food and Drug Administration and state and local health de-

partments should be urged by all members of the dental profession to continue to surround dentifrices with the safeguards necessary to public health.

Under this extension of its program, the Council on Dental Therapeutics, although not accepting cleansing dentifrices for inclusion in Accepted Dental Remedies, will continue to examine them routinely and will publish reports of its findings as conditions warrant. The annual report on "The Status of Dentifrices," published by the Council, will be continued and will contain data on the composition of the more widely used cleansing dentifrices and comments on the claims made for them.

The educational program of the Council will be expanded. Literature on dentifrices, toothbrushes and mouthwashes will be prepared and distributed without charge. Reprints of Council articles and other material will be available on request to the Council. Cooperation with governmental, professional and consumer agencies will be maintained as in the past.

Under this program, the Council hopes to be able to give increased attention to other products within its scope for which the development of scientific data and standards also will be highly significant to practicing dentists. Thus the many products which compete for the dentist's attention, often on the sole basis of the art of the advertising writer, will have less chance for survival if they do not lead directly to the welfare of the patient and to the convenience and success of the practicing dentist.

## COUNCIL LISTS PRODUCTS FOR "ACCEPTED DENTAL REMEDIES"

The Council on Dental Therapeutics of the American Dental Association announces the inclusion of the following products in the list of Accepted Dental Remedies:

### Anesthetics—Local[1]

*Monocaine HCl (0.03 gm.), Epinephrine (0.00002 gm.) Tablets:* Each tablet is stated to contain monocaine HCl, 0.03 gm.; epinephrine, 0.00002 gm.; sodium chloride, 0.008 gm., and sodium bisulfite, 0.002 gm. One tablet dissolved in 2 cc. of sterile distilled water will give a solution of 1½ per cent monocaine HCl with 1:100,000 epinephrine. Marketed in vials of 100 and bottles of 500 tablets. Manufactured by Novocol Chemical Mfg. Co., Inc., Brooklyn, N. Y.

1. A.D.R. Ed. 13, p. 48.

*Procaine HCl Solution 2%:* Each cubic centimeter is stated to contain procaine HCl, 0.02 gm.; sodium chloride, 0.005 gm.; sodium bisulfite, 0.0015 gm.; chlorobutanol (chloroform derivative), 0.0035 gm., and water for injection, q.s. Distributed by S. F. Durst & Company, Philadelphia.

*Procaine HCl 2%, Epinephrine 1:50,000:* Each cubic centimeter is stated to contain procaine HCl, 0.02 gm.; epinephrine (as hydrochloride), 0.00002 gm.; sodium chloride, 0.005 gm.; sodium bisulfite, 0.0015 gm.; chlorobutanol (chloroform derivative), 0.0035 gm., and water for injection, q.s. Distributed by S. F. Durst & Company, Philadelphia.

*Water for Injection-Durst:* A brand of Water for Injection, U.S.P. Distributed by S. F. Durst & Co., Philadelphia.

### Epinephrine and Related Substances[2]

*Epinephrine Injection, U.S.P. 1:1,000-Durst:* Each cubic centimeter is stated to contain epinephrine (as hydrochloride), 0.001 gm.; sodium chloride, 0.009 gm.; sodium bisulfite, 0.0015 gm.; chlorobutanol (chloroform derivative), 0.0035 gm.; water for injection, q.s. Distributed by S. F. Durst & Co., Philadelphia.

### Sodium Salts[3]

*Normal Saline Solution-Durst:* A brand of Isotonic Sodium Chloride Solution, U.S.P. Distributed by S. F. Durst & Co., Philadelphia.

### Penicillin and Streptomycin[4]

*Penicillin Troches-Bristol:* Each troche is stated to contain granulated cane sugar, 11 grains; precipitated chalk, 2.1 grains; talc, 0.7 grains; magnesium stearate, 0.15 grains; calcium penicillin G, 1,200 units, and oil of peppermint, 1/20 minim. In bottles of 20. Manufactured by Bristol Laboratories, Inc., Syracuse, N. Y.

2. A.D.R. Ed. 13, p. 131.
3. A.D.R. Ed. 13, p. 12.
4. A.D.R. Ed. 13, p. 104.

Admission of a product to the list of Accepted Dental Remedies means that the product and the methods by which it was marketed at the time of consideration were not found to be in violation of the Council's published rules. Accepted products are reconsidered periodically. The files of the Council contain information on many drugs and dental cosmetics which is available upon request, and inquiries are welcomed.—*Donald A. Wallace, Secretary.*

## MISBRANDED BONAID TABLETS SEIZED AND DESTROYED BY THE FOOD AND DRUG ADMINISTRATION

1880. Misbranding of Bonaid Tablets. U.S. v. 139 Bottles and 22 Bottles of Bonaid Tablets. Default decree of condemnation and destruction. (F.D.C. No. 17341. Sample No. 31228-H.)

Libel Filed: September 10, 1945, Southern District of California.

Alleged Shipment: On or about April 24, 1945, by the L. M. and W. Products Co., from Detroit, Mich.

Product: 139 100-tablet bottles and 22 600-tablet bottles of Bonaid Tablets at Los Angeles, Calif. Examination indicated that the product contained, among other things, approximately 117 mg. of calcium and 54 mg. of phosphorus per tablet.

Label in Part: "Bonaid 100 (or "600") Tablets. Each Tablet contains natural Bone Phosphate (supplying Calcium, Phosphorus, * * *), plus 200 U.S.P. Units of Vitamin D Synthetic in a base of suitable excipients."

Nature of Charge: Misbranding, Section 502 (a), the label statements, "Bonaid Tablets aid in building sound teeth, nails and bones * * * an effective aid in the prevention of tooth decay" were false and misleading since the article would not be effective to build sound teeth, nails and bones, or to prevent tooth decay.

The article was also alleged to be misbranded under the provisions of the law applicable to foods, as reported in notices of judgment on foods.

Disposition: November 20, 1945. No claimant having appeared, judgment of condemnation was entered and the product was ordered destroyed.

June 1947.

# $1,084,000 BUDGETED BY STATES FOR DENTAL HEALTH ACTIVITIES DURING FISCAL YEAR 1945-1946

STATE and territorial health agencies had a total of $1,084,000 available for dental health purposes during the year ending June 30, 1946, according to a report released recently by the United States Public Health Service. During the same period, the states, territories and possessions expended more than $860,000 of the budgeted amount. About $220,000 was not officially accounted for at the time the report was prepared. However, some state reports on dental expenditures were lacking or incomplete, and, therefore, do not present a complete picture of all expenditures.

Additional funds are known to have been expended for dental health purposes at the state level, but are included in general health budgets, according to John W. Knutson, Chief of the Dental Health Section, States Relations Division, United States Public Health Service. In addition, separate data are not available on expenditures in many city and county dental programs which do not receive funds from state or federal sources.

Funds for dental health purposes at the state level came principally from two sources: appropriations by state legislatures, and by Congress to the Children's Bureau and to the United States Public Health Service. The two federal agencies in turn distributed Congressional funds as outright grants to the states or as grants which were matched by state funds. On an over-all national basis, state legislatures appropriated about $455,000 or 42 per cent of the total amount. The United States Public Health Service provided $144,000 or 13 per cent, and other federal agencies, principally the Children's Bureau, provided $453,000 or 42 per cent. Local funds reported by state authorities amounted to only 3 per cent. The table presents summary figures on the amounts budgeted by source.

Source, amount and percentage distribution of funds budgeted for dental health purposes for year ending June 30, 1946

| Source | Amount budgeted | Percentage distribution |
|---|---|---|
| State funds | 455,014 | 42.0 |
| U.S.P.H.S. general health fund | 144,221 | 13.3 |
| U.S.P.H.S. VD control | 2,000 | 0.2 |
| Local funds | 29,559 | 2.7 |
| Other federal agencies (principally Children's Bureau) | 453,347 | 41.8 |
| Total United States | $1,084,141 | 100.0 |

Available reports indicate that the District of Columbia had the largest budget for dental health purposes, amounting to almost $100,000. States with the largest state-federal budgets were New Jersey, with $84,000; Pennsylvania, with $83,000; New York and South Carolina, each with $49,000, and Michigan and North Carolina, each with $44,000. Six states had budgets of less than $5,000 each for dental health purposes.—*J. E. Bagdonas, Secretary.*

# REVISION OF LIST OF CERTIFIED DENTURE RESINS

SAMPLES of the Certified Denture Resins in the following list were tested recently by the American Dental Association research fellowship at the National Bureau of Standards under the supervision of that bureau and were found to comply with American Dental Association Specification No. 12 for Denture Base Material, Acrylic Resin or Mixtures of Acrylic and Other Resins. This list supersedes that published on page 1462 of the November 1, 1946 issue of THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION.

| *Material* | *Form* | *Manufacturer or Distributor* |
|---|---|---|
| Acralite | Clear; pink; powder-liquid | Acralite Co., Inc. |
| Ac-Ril | Pink; powder-liquid | Ac-Ril Dental Corporation |
| Acri-Lux | Pink; powder-liquid | Acri-Lux Dental Mfg. Co. |
| B-B | Clear; pink; powder-liquid | Bell Dental Products Co. |
| Certified | Pink; powder-liquid | Lee S. Smith & Son Mfg. Co. |
| Coralite | Pink; powder-liquid | Coralite Dental Products Co. |
| Crystolex, Regular | Pink; powder-liquid | Kerr Dental Mfg. Co. |
| Crystolex, Form 102 | Pink; powder-liquid | |
| Densene 33 | Clear; pink; powder-liquid | Cosmos Dental Products, Inc. |
| Hygienic | Pink; powder-liquid | The Hygienic Dental Rubber Co. |
| Justi-Tone | Pink; powder-liquid | H. D. Justi & Son, Inc. |
| Lang's | Pink; powder-liquid | Lang Dental Mfg. Co. |
| Lucitone | Clear; pink; plastic cake | The L. D. Caulk Co. |
| | Clear; pink; powder-liquid | |
| Luxene 44 | Pink; plastic cake | Luxene, Inc. |
| Marvel | Pink; powder-liquid | Marvel Dental Products Co. |
| Premier | Clear; pink; powder-liquid | Premier Dental Products Co. |
| Opalex "45" | Pink; powder-liquid | The Opalex Co. |
| Vernonite | Clear; pink; plastic cake | Vernon-Benshoff Co. |
| | Pink; powder-liquid | |
| Vitacrilic D,L | Pink; powder-liquid | Fricke Dental Mfg. Co. |
| Vita-Lite | Clear; pink; powder-liquid | Vita-Lite Products Co. |
| Vitalon | Pink; powder-liquid | Austenal Laboratories, Inc. |

# BOOK REVIEWS

**Medical Research. A Symposium.** Edited by Austin Smith, M.D. 169 pages, with 17 illustrations. Price $5. Philadelphia: J. B. Lippincott Company, 1946.

The first chapter of this book especially might well be made required reading for all persons who contemplate entering medical research or allied fields. The book as a whole can be recommended to a large group of readers. It should be valuable to those who have an administrative relation to research activities. It should be helpful to those who merely wish a better understanding of the methods and disciplines inherent in scientific research.

Nine authors have contributed to this symposium. The approach of each author is not dogmatic but thoughtful and honestly critical. The reader is impressed with the emphasis on the necessity for rigorous evaluation of all phases of an original study. "Whether a research be modest or pretentious, it must meet the strict criteria of scientific evidence: . . ." "Bacon warns against reliance on impressions, a rich source of errors that has vitiated much of medical lore in the past, and which is just as ready now to perpetuate old errors and to create new ones. . . ." One author states, "It is unfortunate for the public at large and embarrassing to the medical profession that every now and then some over-enthusiastic tyro at medical research makes a bid for fame by a pronouncement based on a research which has been poorly conceived, and is technically unsound or the conclusions of which cannot be substantiated." Still another author has observed that "many men cannot do research because they cannot admit even to themselves that much of their practice is unsatisfactory or illogical or harmful. Some even develop such a proprietary feeling for their mode of treatment . . . that they think and act as though they had invented it and fight for it as they would for a favorite child who can do no wrong."

In addition to these more general considerations, attention is directed specifically to organizing and equipping a suitable laboratory, to the problems confronting the manufacturer in the development of new drugs and to the utilization of photography in medical research.

All those who are concerned with the future of scientific research will be interested in the discussion of government, universities, foundations and commercial firms as the sources of support for investigative work.

An error of minor significance in the last chapter of the book is the use of the conventional symbol for micron when millimicron is obviously intended.—*J. Roy Doty.*

**Penicillin Therapy.** By John A. Kolmer, M.D. Second edition. 339 pages, with 27 illustrations. Price $6. New York: D. Appleton-Century Co., 1947.

Kolmer has contributed a most interesting and instructive book on penicillin and other antibiotic agents. After a short history of the drug, the subjects of production, assaying and physical and chemical properties are discussed.

Well-written and enlightening chapters are devoted to the sensitivity of organisms to the drug and their acquired resistance and to the pharmacology and toxicity as related to administration to human beings. The mechanism of antimicrobial activity and synergistic activity with the sulfonamides are discussed. There are excellent chapters on the principles of treatment with penicillin, methods of administration and dosage.

The greater portion of the book is devoted to the use of penicillin in the treatment of specific diseases related to infection. Of special interest to dentists is the discussion on subacute bacterial endocarditis, in which Kolmer charges the dentist with the grave responsibility of cooperation with the physician to keep the mouth free from infection and with the necessity of premedication with penicillin or the sulfonamides to prevent bacteremias associated with extraction. Much of this portion of the book is designed for the physician, but good, although limited, discussions are devoted to dentistry and oral surgery.

The third part of the book is devoted to the clinical application of other antibiotic agents. The ones of chief interest to dentists are tyrothricin and gramicidin. The book is excellently supported by an abundance of references. Although designed primarily for physicians, the book has a wealth of information for dentists and is highly recommended as a basis for the principles of administration. —*T. J. H.*

# CURRENT LITERATURE

Journal of Oral Surgery
January 1947

Titles marked with an asterisk (*) are reviewed below.

*Cysts of the Jaws; Saving Involved Vital Teeth by Tube Drainage. Earle H. Thomas, Chicago.—1.
*Multiple Fractures of the Facial Bones: Report of Case. Donald T. Waggener, Lincoln, Neb.—10.
*Sulfadiazine Reactions: Report of Three Cases. C. Richard Miller, Harrisburg, Pa.—17.
*Cellulitis of the Face Complicated by Brain Abscess: Report of Case. C. Richard Miller, Harrisburg, Pa.—21.
*Ludwig's Angina With Overwhelming Widespread Sepsis: Report of Case. C. Richard Miller, Harrisburg, Pa.—23.
*Hereditary Hypertrophy of the Maxilla and Mandible: Report of Case. C. Richard Miller, Harrisburg, Pa.—25.
*Surgical Correction of Mandibular Prognathism: Report of Case. John W. Kemper, Ann Arbor, Mich.—29.
*Compound Completely Displaced Fracture of the Mandible: Report of Case. Ralph G. Peterson, Minneapolis.—33.
*The Problem of Hemophilia in Oral Surgery. Ralston I. Lewis, and William Jack, Chicago.—37.
*Tantalum in Temporomandibular Arthroplasty: Report of Case. J. Orton Goodsell, Saginaw, Mich.—41.
*Fractures Involving the Mandibular Condyle: A Post-Treatment Survey of 120 Cases. Members of Chalmers J. Lyons Club.—45.
*Osteomyelitis of the Maxilla: Report of Case. Fred G. Repass, Roanoke, Va.—74.
*Salivary Calculus in Wharton's Duct: Report of Case. Fred G. Repass, Roanoke, Va.—75.
*Adamantinoma (Ameloblastoma) of the Mandible. Ralph G. Peterson, Minneapolis.—78.
*Dentigerous Cyst of the Mandible: Report of Case. Cedric Kenneth Dittmer, Chicago.—81.

**Cysts of the Jaws; Saving Involved Vital Teeth by Tube Drainage.** Earle H. Thomas.

The author describes a method of continuous drainage, by means of a metal tube or plug, for various cysts of the jaw in order to eliminate the bony defect. The drainage is adequately maintained until the cyst wall merges with the surface epithelium or until sufficient time for healing has elapsed to allow the cyst wall to be enucleated without endangering important structures.

Many cases, including dentigerous and infected cysts, are reported and illustrated with roentgenograms.

The author particularly recommends this type of treatment for the cyst that involves the inferior dental nerve in cases where surgical enucleation might result in permanent injury to the nerve, or if removal of a cyst of the maxilla may result in an opening into the antrum.

"(Two important considerations in the treatment of odontogenic cysts of the jaws must be kept in mind when tube drainage or Partsch operations are undertaken. Dentigerous cysts are potential ameloblastomas and a sufficient amount of cyst wall should be removed for microscopic diagnosis. Surgical enlargement of the oral opening may become necessary to maintain adequate drainage until sufficient cyst wall contraction towards the surface has taken place. Editor.)"

**Multiple Fractures of the Facial Bones: Report of Case.** Donald T. Waggener.

Waggener reports a case of multiple fractures of facial bones that resulted from an airplane crash. Manipulative treatment of the fractured bones was delayed because of the patient's general condition and an injury to the cranium which led to drainage of cerebrospinal fluid.

Comminuted fractures of the mandible, maxilla and zygoma were reduced by means of silver cast splints applied to the teeth, and skeletal pin fixation with traction on a plaster head cast. The case is illustrated with photographs of roentgenograms and the appliance that was used for head cast traction and pin fixation.

**Sulfadiazine Reactions: Report of Three Cases.** C. Richard Miller.

Miller reports and describes three cases of dermatitis medicamentosa that resulted from sulfonamide therapy. The drug was administered prophylactically to 65,000 naval personnel within the course of a year. There were

fifteen severe reactions and about 25 per cent of the group had mild dermal reactions.

One of the patients described exhibited severe generalized reactions that were characterized by a vesicular rash, bullae, blebs and crusting. Mucous membranes were particularly, and, in most cases, usually, affected.

Another case resulted from the use of a sulfonamide ointment incorporated in a lipstick that was employed for chapped lips. The patient was referred with the diagnosis of herpes labialis. Treatment consisted of bicarbonate of soda as a mouthwash and a 1 per cent solution of gentian violet applied topically.

The author presented the cases to show that sensitization might appear during some minor treatment in or about the mouth and that dentists should know the possible dangers of administering sulfonamides either locally or by mouth.

**Cellulitis of the Face Complicated by Brain Abscess: Report of Case.** C. Richard Miller.

The patient gave a history of having an upper third molar removed eight days prior to admission to the hospital. His face had been swollen for five days. Clinical findings were swelling of the left side of the upper jaw and acute gingivitis. Roentgenographic findings were negative.

Early treatment consisted of sulfathiazole 1 gm. every four hours until the patient showed some improvement. The sulfonamide was discontinued at some time before the patient's twentieth day in the hospital, at which time the patient was febrile and convulsive.

Penicillin 20,000 units was administered every three hours. Spinal fluid findings were positive for meningitis. Administration of penicillin was continued for eight days, at the end of which time there was no evidence of meningeal irritation. The drug was discontinued. Nine days after the end of penicillin treatment the patient suffered a convulsive seizure. He died two days later.

At autopsy, three separate brain abscesses were found in the left cerebral hemisphere. Organisms, which were never recovered by aerobic culture, proved to be anaerobic.

**Ludwig's Angina with Overwhelming Widespread Sepsis: Report of Case.** C. Richard Miller.

The patient had a lower third molar removed two days prior to admission to the hospital. Clinical examination revealed extensive swelling of the neck and floor of the mouth. The tongue was elevated to the roof of the mouth.

Immediate treatment consisted of sulfadiazine 5 gm., physiologic salt solution, and 50,000 units penicillin, all administered intravenously. Further treatment with sulfadiazine and penicillin failed to effect any change in the course of the cellulitis, and the patient's temperature remained at 104.5 F.

Two days after admission the patient died while being prepared for a tracheotomy.

At autopsy the tissues of the neck showed diffuse inflammation, and both submaxillary glands were filled with purulent exudate. There was early fibrinous pericarditis and bilateral pleurisy of an early fibrinous nature. Cultures revealed nonhemolytic streptococci.

**Hereditary Hypertrophy of the Maxilla and Mandible: Report of Case.** C. Richard Miller.

A young man, aged 18, showed extensive hypertrophy of the maxilla and mandible involving the alveolar ridges. The patient stated that his mother's mouth was in the same condition. The patient's teeth were extremely carious and malposed. The deformity was disabling and his appearance was unattractive.

An alveolectomy of the hypertrophic and irregular ridge and a dissection of the fibrous tissue were performed along with extraction in four stages of the remaining teeth. The patient's appearance and masticatory efficiency were greatly improved.

Diagnosis: Fibrosis of the alveolar ridge.

**Surgical Correction of Mandibular Prognathism: Report of Case.** John W. Kemper.

The case is that of a white woman, aged 30, with an unsightly developmental mandibular prognathism. The patient suffered a cross bite and posterior malocclusion.

Study models were made to determine the correct amount of bone to be removed from the mandible on either side. It was decided to remove bone from both sides in the bicuspid and molar region where teeth had previously been lost. An orthodontic appliance was constructed and attached to the upper and lower teeth before operation.

An external approach was used to remove the correct amount of bone on each side. A stainless steel wire loop ligature was used to approximate the fragments. The teeth were

then brought into occlusion by rubber band traction on the orthodontic appliances.

Nine weeks later the intra-oral appliances were removed and it was found that there was good union on both sides, normal occlusion and a marked cosmetic improvement. Three months after operation, sensation returned to the lower lip.

**Compound Completely Displaced Fracture of the Mandible: Report of Case.** Ralph G. Peterson.

A white boy, aged 5, suffered a badly comminuted fracture of one side of the mandible with extensive lacerations of cheek and oral mucosa.

With the patient under general anesthesia, modified Risdon wire arch bars were applied to both upper and lower teeth and comminuted segments of the fractured mandible were approximated and held in position by intermaxillary traction.

Eight weeks later a second operation revealed good clinical union of bone and it was necessary to remove nonvital bone sequestrae including a deciduous tooth at the site of fracture. Examination also revealed an abnormally erupted permanent second bicuspid in the region of the fracture.

**The Problem of Hemophilia in Oral Surgery.** Ralston I. Lewis and William Jack.

Hemophilia is defined as the tendency to bleed inherited by males. It is characterized by a markedly prolonged coagulation time of the blood, although the bleeding time remains normal. The defect is transmitted as a recessive sex-linked characteristic and follows the laws of the mendelian pattern in that it affects only the male. The female is the carrier but never manifests the disease.

Treatment of bleeding is unaffected by the usual hemostatic measures. Blood transfusions and hospital care are essential when surgical procedures become necessary. History of a lifelong tendency to bleed, inherited from the maternal side of the family, and a prolonged coagulation time of the blood are necessary to establish the diagnosis.

**Tantalum in Temporomandibular Arthroplasty: Report of Case.** J. Orton Goodsell.

The case reported is that of unilateral ankylosis of the temporomandibular joint, which apparently developed from a fall that caused injury to the mandible when the patient was an infant. The patient was first seen at the age of 13 and gave a history of one unsuccessful operation for condylar resection, performed shortly after the injury was incurred.

The author performed a resection of the ramus on the affected side, using the Risdon approach, and inserted masseter muscle tissue between the severed bone ends. When seen one year later, the patient showed evidence of immobility, which in three years time was practically complete.

A second operation was performed by the same approach, consisting mainly of an external incision near and at about the angle of the mandible and superior traction of the soft tissues to expose the ramus of the mandible. A vibrating saw was employed to resect the ramus horizontally at a point above the mandibular foramen. After resection tantalum foil was adapted and wired in place over the cut end of the lower fragment.

When seen one year later the patient had normal opening of the mouth, function was perfect and there was no discomfort.

**Fractures Involving the Mandibular Condyle: A Post-Treatment Survey of 120 Cases.** Members of Chalmers J. Lyons Club.

The Chalmers J. Lyons Club conducted an extensive survey of cases of fractures involving the mandibular condyle, which were treated by its members, in order to evaluate the results of the methods employed.

Anatomic relationships, classification of the types of fracture, based on condylar displacement, diagnosis, the open and closed methods of treatment and significant complications are thoroughly presented.

Analysis of 120 cases revealed that 108 were treated by intermaxillary fixation alone or by closed reduction. The average interval between treatment and follow-up survey was five years. Only 7 cases showing a functional type of disturbance were found and there were no cases of ankylosis or deformity.

In regard to ankylosis as being a possible complication of condylar fractures, the group mention a recent review by Jacobson of 62 cases of ankylosis of the temporomandibular joint that were seen over a period of thirty years in a large hospital, and of which not one case of condylar fracture was found as the cause for this disorder.

They conclude from the survey that condylar fractures mend well and satisfactory func-

tion is attained without accurate realinement of fragments; that conservative methods of closed reduction and intermaxillary fixation are a simple and effective approach to the aims of treatment; that surgical methods in open reduction and direct fixation have defamatory hazards and few indications; that ankylosis as a complication of fractures of the condyle is extremely infrequent; that disturbances to epiphyseal growth did not appear among the younger or skeletally immature patients in the group studies reported, and that the survey substantially supports the principle that conservative management yields satisfactory results with minimal difficulties.

**Osteomyelitis of the Maxilla: Report of Case.** Fred G. Repass.

The author reports a case of osteomyelitis that developed after the removal of two maxillary anterior teeth. The patient stated that his face was swollen, the teeth were extremely sore and he had a fever at the time the teeth were removed.

After adequate drainage and eventual sequestration, healing occurred.

**Salivary Calculus in Wharton's Duct: Report of Case.** Fred G. Repass.

Repass discusses the occurrence and prevalence of salivary calculus within the submaxillary gland. Exclusive of epidemic parotitis, calculus within the duct or gland is the most common condition affecting the salivary glands. Their cause is believed to be a deposition of salts upon small foreign bodies or bacteria. The disease is mistaken for lymphadenitis or cellulitis. The history of increased swelling and pain during intake of food, as well as roentgenographic examination, is of utmost value in confirming the diagnosis.

The patient went to the dentist because of swelling of the floor of the mouth that was thought to be arising from a "sore and loose wisdom tooth."

Roentgenographic examination revealed a dumbbell-shaped calculus within Wharton's duct. Healing occurred uneventfully after surgical removal of the stone.

**Adamantinoma (Ameloblastoma) of the Mandible.** Ralph G. Peterson.

Peterson reports a case of ameloblastoma of the mandible in a man, aged 55. The growth was symptomless and was discovered during a routine examination. Roentgenograms revealed a destruction of bone involving the symphysis and extending from one molar area to the other.

At operation all mandibular teeth involved by the growth were extracted, and a firm and meaty tumor was removed. The entire cavity was cauterized with phenol and neutralized with alcohol. Dressings were changed routinely until the defect became completely lined with epithelium. Roentgenograms taken three years later showed complete regeneration of bone.

**Dentigerous Cyst of the Mandible: Report of Case.** Cedric Kenneth Dittmer.

Dittmer reports a case of dentigerous cyst of the mandible in a white woman, aged 28.

Roentgenograms showed a large cystic space that apparently was arising from the follicle of an impacted mandibular cuspid. The roots of the teeth involved by the cyst showed extensive resorption. The cyst lining and impacted tooth were removed, and the teeth showing root resorption were left intact. The involved teeth did not respond to vitality tests. However, three years after operation they were firm and functional and gave no discomfort.—*H. L. Hubinger.*

## Journal of Dental Research
## April 1947

Titles marked with an asterisk (*) are reviewed below.

*The Influence of Sodium Bisulphite on Acid Production in Saliva. Samuel Driezen, Arvin W. Mann, Tom D. Spies, Bess C. Carson and J. K. Cline, Hillman Hospital, Birmingham, Ala., and University of Cincinnati.—93.

*Dental Caries and Tryptophane Deficiency. Naomi C. Turner and George E. Crowell, Forsyth Dental Infirmary.—99.

*A Note on the Duration of Caries Inhibition Produced by Fluoride Applications. B. G. Bibby and S. S. Turesky, Tufts College.—105.

*Solubility of Enamel as Affected by Fluorides of Varying pH. Ralph W. Phillips and Joseph C. Muhler, Indiana University.—109.

*Solubility of Enamel Protected by Sodium Fluoride and Other Compounds. Joseph C. Muhler and Grant Van Huysen, Indiana University.—119.

*Studies in Dental Public Health Administration. II. The Role of Roentgenograms in Public Health Dental Surveys. Neal W. Chilton and L. E.

Greenwald, New Jersey State Department of Health.—129.

*Capacity of Periodontal Vessels on Pressure and Tension Sides of Teeth Moved by Orthodontic Appliances. John Revesz and Samuel W. Chase, Western Reserve University.—143.

*Experimental Amelotomy. William Lefkowitz, Harry H. Shapiro and Charles F. Bodecker, New York.—151.

*Induced Fuso-Spirochetal Infection in Dogs. Henry M. Swenson and Joseph C. Muhler, Indiana University.—161.

Bilateral Dens in Dente. W. F. Swanson and F. M. McCarthy, Jr., University of Pittsburgh. —167.

International Association for Dental Research. Scientific Proceedings of the New York Section, January 30, 1947. Frances Krasnow, Guggenheim Dental Clinic.—173.

**The Influence of Sodium Bisulphite on Acid Production in Saliva.** Samuel Dreizen, Arvin W. Mann, Tom D. Spies, Bess C. Carson and J. K. Cline.

Recent attempts at dental caries control have been in the direction of decreasing the rate of acid formation in the mouth and increasing the rate of acid neutralization in regions associated with the caries susceptible portions of the teeth. The latter has been difficult to achieve, with the result that most of the recent investigations have aimed at decreasing the rate of acid formation in the mouth. Chemical inhibitors of enzyme systems which will accomplish this purpose include urea, ammoniacal silver nitrate, fluorides and synthetic vitamin K. The synthetic vitamin K was used in the form of its sodium bisulfite addition compound. The sodium bisulfite was used to render the vitamin K water soluble. Since sodium bisulfite has long been regarded as an antiseptic and an antifermentation agent, it was decided to determine whether it could interfere with acid production in saliva in its own right. It was tested on the saliva of 22 patients both *in vivo* and *in vitro*. In each case it markedly reduced acid formation in the saliva regardless of the amount of acid produced in the control samples, which contained no sodium bisulfite. Its action appears to be one of fixation of the aldehydes produced as intermediate products in carbohydrate degradation with the result that the formation of lactic acid is inhibited.

**Dental Caries and Tryptophane Deficiency.** Naomi C. Turner and George E. Crowell.

A low content of tryptophane or similar molecule containing indole in saliva shows a correlation with rampant dental decay. Persons having active and rampant caries show only a trace of tryptophane by glyoxylic acid, conc. $H_2SO_4$ test. Persons free from caries show from 3/8 inch to 1 inch purple coloration when this test is applied to their saliva. Two other tests were applied to these salivas: (1) dextrinating time and (2) decolorization time. Long dextrinating and short decolorization correlated with freedom from caries; short dextrinating and long decolorization correlated with rampant caries. The redox poise drop of these salivas was studied on the Beckman potentiometer.

As an incident to the experimental ingestion of crystalline d l-tryptophane, a small group of young adults volunteered to undergo an experiment to test drop in blood sugar. The changes in fasting blood sugar levels after these ingestions appear to be significant. Among the 9 subjects, only 1 failed to show a decrease in the blood sugar level. For the other 8, the average fasting blood sugar before ingestion of tryptophane was 96 mg. (range, 75 to 113 mg.) per 100 cc., and after ingestion of tryptophane 70 mg. (range, 63 to 88 mg.). In 2 control subjects, there was an average gain in the blood sugar level of 3 mg. per 100 cc.

**A Note on the Duration of Caries Inhibition Produced by Fluoride Applications.** B. G. Bibby and S. S. Turesky.

Thirty-nine patients who had had one quadrant of their teeth treated six times during a two-year period with a 0.1 per cent sodium fluoride solution were reexamined three years after the cessation of such treatments. The treated quadrants still showed approximately 36 per cent less new decay than the untreated quadrants. During the period of suspended treatment the occurrence of new decay was approximately 30 per cent less in the quadrants which had been treated three years previously.

**Solubility of Enamel as Affected by Fluorides of Varying pH.** Ralph W. Phillips and Joseph C. Muhler.

It has been well established that fluorine reduces enamel solubility and thus inhibits

dental caries. The definite mechanism by which fluorine acts and various other variables involved in its use are not known. One of these is the most effective pH for the fluorine solution when fluorine is employed for topical application.

By study of the solubility of teeth after treatment with sodium fluoride solutions of varying pH, it was found that the most effective pH, both for whole tooth sections and powdered enamel, was 2.6. When subsequently treated with a decalcifying solution, enamel was least soluble after immersion in a sodium fluoride solution with a pH of 2.6. Tests also showed that this low pH was not injurious to enamel in the period of time normally used in topical application.

**Solubility of Enamel Protected by Sodium Fluoride and Other Compounds.** Joseph C. Muhler and Grant Van Huysen.

Saliva and several reagent solutions were tested to determine their value in protecting powdered dental enamel against solubility in weak organic acids. An unfiltered 1/500 stannous fluoride solution was found to be most effective in this respect. It was also shown that $UO(NO_3)_2$ solutions, when placed in contact with powdered enamel, also reduced its solubility. By use of the Geiger-Muller counter it was shown that the $UO(NO_3)_2$ which was picked up by the enamel was retained tenaciously even after attempts were made to remove it by washing the treated enamel.

**Studies in Dental Public Health Administration: II. The Role of Roentgenograms in Public Health Dental Surveys.** Neal W. Chilton and Louis E. Greenwald.

In order to determine the importance of mass roentgenographic examination of children in dental public health surveys, the authors compared a sample of 729 children examined with and without roentgenograms with a survey of 2,540 children from whom the sample was taken. Statistical comparisons were made between the results of examination of the sample with and without x-ray examination and with the results of the whole survey. The authors conclude that there is no statistically significant difference between examinations performed in school rooms with mouth mirrors and explorers and those performed in dental clinics with the same instruments. Although a statistically significant difference may exist between the results obtained from examination with and without roentgenograms, no practical difference exists when the surveys are made to determine the dental needs of school populations or to compare the dental status of groups. When these surveys are conducted for research purposes, roentgenographic examination is to be desired.

**Capacity of Periodontal Vessels on Pressure and Tension Sides of Teeth Moved by Orthodontic Appliances.** John Revesz and Samuel W. Chase.

In a 10 year old macaque, weighed paper cutouts were used to compare the vascularity of the periodontal membrane on the pressure sides and the tension sides of teeth moved by orthodontic appliances. Although the number of vessels on opposite sides is approximately equal, vascularity on the tension side is greater than on the pressure side in proportion to the force applied. For example, for the upper cuspids moved by the fairly strong, continuous force of a lingual expansion arch wire the tension sides of the periodontal membranes have, respectively, 6.3 and 3.7 times richer blood supply than the pressure sides. A lower first molar, subjected to the brief action of a separating wire, has 3.0 times richer blood supply on its tension side. The vascularity of opposite sides approaches equality in the adjoining second molar and in incisors and bicuspids used as controls. The vessels on the tension side are markedly larger than those on the pressure side, but all vessels retain their cylindrical form. Numerical equality of vessels with open lumina on opposite sides is the result of greatly increased numbers of capillaries in regions of bone resorption.

**Experimental Amelotomy.** William Lefkowitz, Harry H. Shapiro and Charles F. Bodecker.

Previous studies on the effects of surgical removal of the dental papilla *in vivo* of partially formed teeth demonstrated that calcification of the enamel was arrested. In order to investigate further the source and mechanism of enamel calcification, the enamel organ was surgically removed from the incisal half of partially formed teeth of dogs. Specimens were taken at various subsequent periods. This report deals only with the study of ground sections. Examination of control specimens at the age of experimentation shows that, in the matrix state, the pattern of calcification follows that of formation. Similar specimens

colored with von Kossa's stain suggest that the dentinal tubules are the purveyors of calcifying elements. Amelectomized teeth, permitted to erupt, showed incomplete formation of the incisal half of the enamel, as a result of the removal of the enamel organ, the source of the organic matrix. Clinical, histologic and soft x-ray examination demonstrate that enamel calcification of the experimental area is complete. All experimental teeth were malposed, erupting lingual to the arches.

**Induced Fuso-Spirochetal Infection in Dogs.** Henry M. Swenson and Joseph C. Muhler.

Normal healthy dogs with good oral hygiene were given daily intravenous injections of 1/20 mgm. scillaren B. During the course of the experiment photographs and smears for Vincent's organisms were taken, and samples of saliva were analyzed for their carbonate content to determine if a correlation existed between the carbonate and the Vincent's infection.

Most of the food ingested was regurgitated. After three injections an increase in fusiform and spirilla organisms was observed. In eight to ten days ulcerative lesions from which Vincent's organisms were isolated occurred on the buccal mucosa, gingiva and tongue.

**Experimental Investigations of Paradontal Disease. Capillary Microscopy as a Clinical Aid to the Assessment of Gingival Health and Disease.** J. D. King. D. Record 67:3, January 1947.

This paper is essentially a preliminary account of an approach to more accurate diagnosis of gum disease, attempting to ameliorate the previous diagnostic expedients. The method consists of examination and photography of the gingival capillaries *in vivo*.

Interpretation of these present findings is based on the close association shown to exist between the vascular, epithelial and connective tissues of the gums in both health and disease. With a capillary microscope designed especially for these purposes, it was found that, in the initial stages of gum disease particularly, the capillary forms of the marginal rather than the submarginal zone comprise the more reliable diagnostic criteria. Increased breadth of the microscopic avascular peripheral zone and brush-line changes in the capillary system were found to be a useful indication of opposition to inflammatory agencies on the part of the tissues. These findings would seem to provide a yardstick for prognosis in that, for any given lesion or patient, the degree of defensive gingival response may be detected. Furthermore, such findings may also prove of value in determining the nature of the etiologic agents—local, systemic or both—responsible for different forms of gingivitis and thus in prescribing the form of treatment most likely to produce satisfactory resolution of the lesions.

In drawing the conclusions of his work, the author states that he is fully aware that a considerable amount of further investigation must be given to the methods of gingival examination described in his report and that capillaroscopy should serve as an adjunct to, not supersede, other more familiar diagnostic procedures.—*Hyman Goldberg.*

**Modifications of the Goldman Technique for Contact Testing of the Buccal Mucosa.** J. Farrington. J. Invest. Dermat. 8:59, February 1947.

The occurrence of mucosal reactions after administration of penicillin, both topically and orally, has necessitated increasing use of contact tests of the buccal mucosa. A modification of the Goldman technic was devised which permitted testing in the mouths of persons wearing artificial dentures. The base of a small rubber cup is cemented to the dental plate by means of collodion. The allergin can then be placed in the cup and so remain in contact with the buccal mucosa for from twenty-four to forty-eight hours. Another method is described for young patients or those for whom the original technic could not be used. A testing cup was devised from an ordinary, tightly rolled, rubber finger cot. A short strand of dental floss is sutured through the base of the cup thus formed and tied to a small button. The short piece of dental floss, connecting testing cup and button, is easily inserted between the teeth. —*J. E. Gilda.*

**Dental Relations in Industrial Health Services.** L. O. Heacock. Indust. Med. 16:5, January 1947.

The Industrial Committee, Council on Dental Health, American Dental Association, prepared a definition of industrial health and a statement of minimum dental services for a plant industrial health program as follows: "Industrial dentistry is that specialty in industrial health service that is concerned with the oral health of the industrial worker as it

affects or is affected by his work and his working environment." Its recommended services include periodic oral examination and diagnosis; emergency treatment and treatment of occupational accidents and illnesses affecting the oral tissues; treatment and elimination of oral sepsis; adequate recording of findings and recommendations; referral of the worker for further remedial and restorative care, and dental health education.—*Hyman Goldberg.*

**Internal Strain in Acrylic Denture Base Material.** John Osborne. Brit. D. J. 82:204, May 1947.

Internal strain is present in all dentures constructed of acrylic resin, no matter what processing technic is used. This strain can be demonstrated in three ways. First, the denture is subjected to increased temperature and the warpage is noted. Second, the denture is immersed in a solvent for a specific period; the solvent will produce a crazing effect in the areas of greatest strain. Third, the denture on cut sections may be observed in polarized light. The degree of strain is reduced when the restoration has curvatures in only one plane and is absent in flat specimens, owing to spontaneous relief after deflasking. The degree of strain can be reduced by polymerization at room temperature for eighteen weeks. The degree of strain is less in dentures carrying acrylic teeth. It is suggested that strain is caused primarily by differences of thermal contraction in the plastic resin, porcelain and metal. Strains in dentures are of no great consequence at ordinary temperatures but lead to serious error in denture repair.—*G. W. Burnett.*

**Salivary Adenoma and Adenolymphoma.** O. C. Lloyd. J. Path. & Bact. 58:699, October 1946.

The author reports 7 cases of a solid variety of adenolymphoma collected at the Radcliffe Infirmary, Oxford, England, between 1939 and 1945. Six were benign, and 1 showed a syncytial reticulo sarcoma of the stroma. Of the benign cases, 5 occurred in women and 1 in a man, chiefly in the third, fourth, fifth and sixth decades. It is considered that all salivary adenomas arise by the one-sided differentiation of embryonal glandular replacement epithelium. The presence of the lymphoid stroma of the adenolymphoma can be explained by the close association of lymphoid and epithelial tissue in the salivary glands and elsewhere in the mouth.—*G. W. Burnett.*

**Should the Neck Nodes Be Dissected in Patients with Carcinoma of the Lip?** R. D. McClure and C. R. Lam. Ann. Surg. 125:658, May 1947.

A total of 176 cases were studied, 97 of which were carcinomas of the lip and 97 squamous cell carcinomas of other parts of the face. Only one carcinoma of the upper lip and one carcinoma of the lip were found in women. All the lesions of the lip were of the squamous cell type and had been noted by the patient for from three months to more than two years prior to treatment. The treatment was chiefly surgical, with radiation in some form used in a few cases. Of 31 patients whose lymph nodes were dissected there were 20 patients in whom the nodes were normal at operation. Only two patients whose lymph nodes were involved at operation survived more than five years. It was concluded that it is unnecessary to carry out dissection of the neck nodes in patients with small early carcinoma of the lip, if there is no palpable evidence of involvement of the lymph nodes. Such patients should be examined every month for one year and every two months for the second year. If metastatic nodes appear, a dissection should be undertaken.—*G. W. Burnett.*

**Dental Pain While Flying or During Decompression Tests.** Harvey Warren. Brit. D. J. 82:113, March 1947.

An analysis of case reports received at the R.A.F. Institute of Aviation Medicine from 1939 to 1944 shows that cold plays a small part, if any, in the production of dental pain during flying. The pain is most often localized, occurs during ascent and may or may not persist on descent. Relief of the pain was achieved in about half the cases by sedative treatment, but extraction was necessary in those remaining. Hyperemia of the pulp has been demonstrated at altitude and may persist at ground level. Because gases are released in the pulp under the lowered pressure of altitude, there is reason to suppose that bubble formation occurs under these circumstances. Standard histologic methods are open to criticism if they are used to demonstrate the formation of bubbles in pulps. A reduction of the number of cases of dental pain during flying was achieved by protection of the pulp from filling material and the acidity of the cement.—*G. W. Burnett.*

## LIST OF DENTAL OFFICERS

## SEPARATED FROM ARMY DENTAL CORPS

THE following list of dental officers separated from the Army Dental Corps does not include rank because such information is no longer furnished by the Surgeon General's Office. Publication will be given to other names as soon as possible.

| | |
|---|---|
| **Alabama** | |
| Birmingham | Marks, Arthur |
| Owens Cross Roads | Ellett, Shelly R. |
| Tuskegee | Davis, Thomas B. |
| **Arkansas** | |
| Altheimer | Pake, Bryant B. |
| Ft. Smith | Waters, Feron G. |
| Paragould | Craig, Charles L. |
| Paris | Kennon, Roy H. |
| **California** | |
| Gilroy | Franklin, William F. |
| Long Beach | Markham, Don C. |
| Los Angeles | Munn, Richard R. |
| Venice | Morrison, Melburn L. |
| **Connecticut** | |
| Greenwich | Marino, Frank D. |
| Hartford | Spector, Benjamin L. |
| Manchester | Halem, Saul M. |
| New London | Castanza, Joseph J. |
| New London | Stoner, Carl |
| Wallingford | Chovitz, Frank J. |
| **District of Columbia** | |
| Washington | Delpeschio, John |
| Washington | Moore, Wallace T. |
| **Florida** | |
| Lake City | Amick, James F. |
| St. Petersburg | Hatcher, William H. |
| **Georgia** | |
| Atlanta | Payne, Hope H., Jr. |
| **Illinois** | |
| Antioch | Zimmerman, Louis J. |
| Chicago | Chakoian, Henry M. |
| Chicago | Herzberg, Fred |
| Chicago | Kehl, Kenneth H. |
| Chicago | Redlich, William E. |
| Evanston | Allison, John R. |
| Highland | Ahlf, Elmer G. |
| Lovington | Elliott, Carl J. |
| **Indiana** | |
| Evansville | Roth, Harold W. |
| South Bend | Plotkin, David |
| **Iowa** | |
| Chariton | Elledge, Frank E. |
| Correctionville | Hickey, James H. |
| **Kansas** | |
| Coffeyville | Schoonover, Ray R. |
| Kansas City | Salyer, Everett A. |
| **Kentucky** | |
| Greenville | Wilson, Morris J. |
| Irvine | Strong, William C. |
| **Louisiana** | |
| Shreveport | Blandino, Joseph A. |
| **Maryland** | |
| Baltimore | Price, Myron I. |
| **Massachusetts** | |
| Gloucester | Cleary, Daniel E., Jr. |
| Lowell | Chigas, Charles G. |
| Lynn | Regis, Ernest G. |
| Malden | Marcus, Samuel |
| Northampton | August, George S. |
| Springfield | Hutner, Melvin L. |
| **Michigan** | |
| Detroit | Krause, Gerald D. |
| Detroit | Thompson, John W. |
| Sturgis | Wiedlea, Clare E. |
| **Minnesota** | |
| Cyrus | Hogy, Raphael J. |
| St. Paul | Schultz, William K. |
| Tower | Weinzierl, Albert N. |
| **Missouri** | |
| Glasgow | Renken, Gustav W. |
| Joplin | Schulte, Joseph C., Jr. |
| Monticello | Galbraith, James R. |
| **Montana** | |
| Cut Bank | Jones, Mark R. |
| **Nebraska** | |
| Beatrice | Kleppinger, Phil H. |
| **New Jersey** | |
| Deal | Wilner, Jacob |
| Newark | Forman, Jacob |
| Newark | Markowitz, Louis J. |
| Newark | Schupper, Nathan |
| Newark | Werner, Irving B. |

| | |
|---|---|
| Newark | Witman, Herman F. |
| Palisade | Small, Bernard E. |
| South Orange | Terracciano, Ralph |

**New York**

| | |
|---|---|
| Bayside | Caufield, Bernard M. |
| Binghamton | Ackerman, William |
| Bronx | Adler, Saul W. |
| Bronx | Leiter, Jacob |
| Brooklyn | Coven, Eugene M. |
| Brooklyn | Fox, Seymour A. |
| Brooklyn | Gilman, Albert |
| Brooklyn | Gutfriend, Joseph |
| Brooklyn | Horn, Martin |
| Brooklyn | Kaplan, Jean |
| Brooklyn | Krane, Max W. |
| Brooklyn | Leventon, Isidore L. |
| Brooklyn | Lewis, Henry |
| Brooklyn | Marks, Arthur |
| Brooklyn | Ross, Bernard |
| Brooklyn | Scheinbach, Seymour C. |
| Brooklyn | Silverman, Sol |
| Brooklyn | Wiener, Zachary S. |
| Brooklyn | Williams, Gordon M. |
| Brooklyn | Zuckerman, Murry |
| Buffalo | Britton, Edgar C. |
| Buffalo | Hudecki, Stephen E. |
| Flushing | Dowling, Alan F. |
| Flushing | Thaler, Morton |
| Forest Hills | Schackner, Selig J. |
| Jackson Heights | Reisman, David I. |
| Long Island | Jannace, Vincent, Jr. |
| Lowville | Richardson, Henry B. |
| Maspeth | Zajkowski, Edward A. |
| New Rochelle | Dreizen, Cellock |
| New York | Amler, Melvin H. |
| New York | Giglio, Joseph V. |
| New York | Jacobs, Robert A. |
| New York | Jurist, Irving |
| New York | Levenson, Seymour |
| New York | Manners, Philip |
| New York | Reibstein, Samuel |
| New York | Resnick, Louis |
| New York | Rogers, Jerome A. |
| New York | Schwartz, Gerald D. |
| Oneida | Sharon, Harold E. |
| Richmond Hill | Okun, Marvin N. |
| Rochester | Dengler, John C. |
| Rochester | Mulligan, Edward A. |
| Sparkill | Munson, Albert W. |
| Staten Island | Thorson, Irger F. |
| Staten Island | Xiques, William A. |
| Valhalla | Richter, Lawrence W. |
| Watertown | Mullen, John B. |

**North Carolina**

| | |
|---|---|
| Fairmont | Mitchell, James V. |
| Greenville | Ward, Stuart J. |
| Wilmington | Furr, James E., Jr. |

**North Dakota**

| | |
|---|---|
| Harvey | Faul, Chester R. |

**Ohio**

| | |
|---|---|
| Canton | Thoman, Robert J. |
| Cleveland | Eisenberg, Max M. |
| Cleveland | Krauss, Carl W. |
| Columbus | Durflinger, Willard L. |
| Columbus | Yaggi, Henry K. |
| Hamilton | Duersch, William A. |
| Oak Hill | Allison, Morgan L. |
| Shaker Heights | Maresh, Matthew F. |

**Oklahoma**

| | |
|---|---|
| Ardmore | Sandlin, Harold G. |

**Oregon**

| | |
|---|---|
| Independence | Carey, Charles B. |
| Portland | Walker, Donald A. |
| Portland | Wheeler, James H. |

**Pennsylvania**

| | |
|---|---|
| Altoona | Marasco, Martin J. |
| Beaver Falls | Colaizzi, Alfred C. |
| Beaverdale | Williams, Howard L. |
| Collegeville | Donath, A. |
| Felton | Hively, James R. |
| Monongahela | Toothman, George W. |
| Philadelphia | Carter, Thomas H., Jr. |
| Philadelphia | Rosenberg, Vernon L. |
| Philadelphia | Whitecar, John P. |
| Pittsburgh | Shapiro, Bernard L. |

**Rhode Island**

| | |
|---|---|
| West Warwick | Iorio, Quentin H. |

**South Carolina**

| | |
|---|---|
| Ninety Six | Satterfield, Ernest W. |

**Texas**

| | |
|---|---|
| Austin | Kasper, Albert H. |
| Brady | Francks, James H. |
| Brenham | Wiese, William H. |
| Commerce | Hayes, David C. |
| Dallas | Burkett, Harry J., Jr. |
| Dallas | Pratt, Louis T. |
| Flatonia | Wheeler, William H. |
| Ft. Worth | Nottingham, Cecil E., Jr. |
| Ft. Worth | Wester, Hall B. |
| Houston | Krause, Walter T. |
| Roscoe | Dawson, Edwin C. |
| San Antonio | Bailey, Robert H. |
| Waco | Harlow, Raymond F. |
| Waco | Webb, Frank C. |
| Winfield | Beck, Ralph L. |

**Utah**

| | |
|---|---|
| Salt Lake City | Ure, Henry M. |

**Virginia**

| | |
|---|---|
| Bridgewater | Shull, Dwight H. |
| Christiansburg | Dickey, Walter H. |
| Clark | Clement, William J. |

**Washington**

| | |
|---|---|
| Battle Ground | Johnson, Wyllis L. |
| Centralia | Convis, Ransom C. |
| Centralia | Mehlenbeck, C. W., Jr. |
| Ellensburg | Myers, Martin B. |
| Seattle | Parosa, Joseph A. |

**West Virginia**

| | |
|---|---|
| Charleston | Moses, Leo F. |
| Mullens | Gilreath, Arvol G. |
| Triadelphia | Naumann, Robert A. |

## LIST OF DENTAL OFFICERS

## SEPARATED FROM NAVY DENTAL CORPS

THE following naval dental officers have been separated from service, according to lists received from the Navy Department. These lists are not complete. Other names will be published as soon as possible.

| | | |
|---|---|---|
| **Alabama** | | |
| Mobile | Brown, James E., III | Lieut. |
| **California** | | |
| Challenge | Coupe, Robert C. | Lieut. |
| Chowchilla | Leer, John L. | Lieut. |
| Los Angeles | Kohlhase, Neill W. | Lieut. |
| Ocean Beach | Stauffer, Roy F. | Lt. Cmdr. |
| Sanger | Fleming, George L. | Lieut. |
| Santa Paula | Brown, Warren G. | Lieut. |
| **Connecticut** | | |
| Ansonia | Hennessy, John F. | Lieut. |
| Hamden | Cozzolino, Michael A. | Lieut. |
| Hartford | Sleeper, Herbert R. | Lieut. |
| Newington | Apter, Stanley M. | Lieut. |
| Norwalk | Rothert, Robert N. | Lieut. |
| **District of Columbia** | | |
| Washington | Trahos, Norman M. | Lieut. |
| **Georgia** | | |
| La Grange | Cleaveland, Pitman R., Jr. | Lieut. |
| Macon | Holliday, Peter O., Jr. | Lieut. |
| **Illinois** | | |
| Chicago | Perloff, Godfrey | Lieut. |
| Chicago | Tisoncik, Joseph T. | Lieut. |
| East Chicago | Leach, Edward R. | Lieut. |
| Peoria | Callahan, John A. | Lieut. |
| **Indiana** | | |
| Indianapolis | Calland, John J. | Lieut. |
| Indianapolis | Hanson, Warren V. | Cmdr. |
| **Iowa** | | |
| Ames | Hixon, Ernest H. | Lieut. |
| Clarinda | Bradrick, Harlan P. | Lieut. |
| Clinton | Eliason, Robert P. | Lieut. |
| Dubuque | Kalb, Anthony J. | Lieut. |
| Iowa City | Ochs, William M. | Lieut. |
| Manchester | Leighton, Robert E. | Lieut. |
| **Kansas** | | |
| Oswego | Fordyce, Robert D. | Lieut. |
| **Maine** | | |
| Portland | Galli, Arthur F. | Lieut. |
| **Maryland** | | |
| Catonsville | Dressel, Harry W. F., Jr. | Lieut. |
| **Massachusetts** | | |
| Boston | Potter, Edgar M. | Lieut. |
| Boston | Widdowson, Robert R. | Lieut. |
| Brockton | Chisholm, Walter K. | Lieut. |
| **Michigan** | | |
| Concord | Landon, Dwight E. | Lieut. |
| Crystal Falls | Sutter, Edwin J. | Lieut. |
| Detroit | Schiff, Paul S. | Lieut. |
| Detroit | Westover, Ransom M. | Lieut. |
| **Minnesota** | | |
| Minneapolis | Rose, Herbert H. | Cmdr. |
| Moorhead | Rasmusson, Dale F. | Lieut. |
| **Mississippi** | | |
| Jackson | Pittman, Romulus A. | Lieut. |
| Ripley | Smith, Billy H. | Lieut. |
| **Missouri** | | |
| Kansas City | Merrill, Guy E., Jr. | Lieut. |
| Meta | Rowan, William F. B. | Lieut. |
| St. Louis | Doyle, Joseph A. | Lieut. |
| **Montana** | | |
| Anaconda | Smollack, Stephen W. | Lieut. |
| **Nebraska** | | |
| Lincoln | Eckert, Max C. | Lieut. |
| Omaha | Karrer, Herbert L., Jr. | Lieut. |
| **New Jersey** | | |
| Morristown | Ossre, Marcus | Cmdr. |
| Newark | Levine, Robert H. | Lieut. |
| South Amboy | Madura, John S. | Lieut. |
| **New York** | | |
| Amsterdam | Sapia, Salvatore M. | Lieut. |
| Ardsley | Morse, Francis F. E. | Lieut. |
| Brooklyn | Adragna, Vito A. | Lieut. |
| Brooklyn | Davne, Albert | Lieut. |
| Brooklyn | Hollenbeck, K. L. | Lieut. |
| Brooklyn | Moshman, Howard B. | Lieut. |
| Brooklyn | Spector, Philip J. | Lieut. |
| Hartsdale | Conaty, Arnold P. | Lieut. |
| New York | Capurso, George J. | Lieut. |
| New York | Carmen, Marvin | Lieut. |
| New York | Daderian, Zaven H. | Lieut. |
| New York | Mann, Robert | Lieut. |
| Staten Island | Cassaviell, Vincent S. | Lieut. |
| Troy | Laskey, George H., III | Lieut. |
| **Oregon** | | |
| Portland | Alexander, Veryl R. | Lieut. |

# DEATHS

Amenta, Lawrence J., Erie, Pa.; School of Dentistry and the Baltimore College of Dental Surgery, University of Maryland, 1923; died June 24; aged 49.

Appleton, Frederick O., Washington, D.C.; School of Dentistry, Georgetown University, 1920; died July 26; aged 65.

Bailey, Joe Z., Conway, Ark.; School of Dentistry, University of Louisville, 1911; died August 1; aged 64.

Barlow, Steaven S., Conway, Ark.; Kansas City-Western Dental College, 1923; died May 9; aged 58.

Beggs, Ernest W., Cadillac, Mich.; Kansas City Dental College, 1909; died August 3; aged 61.

Bender, Edward A., Larchmont, N. Y.; died August 10; aged 47.

Bentley, David G., Cranston, R. I.; Tufts College Dental School, 1923; died August 2.

Bingel, Jacob C., Philadelphia; Medico-Chirurgical College of Philadelphia, 1899; died July 19; aged 78.

Bridwell, W. A. Sturgis, Ky.; School of Dentistry, University of Louisville, 1917; died August 4.

Broeker, Ralph J., St. Louis; School of Dentistry, St. Louis University, 1921; died July 16; aged 54.

Bronson, Irving C., Nora Springs, Iowa; Dental School, Northwestern University, 1899; died July 28; aged 75.

Burdette, Joseph W., Salt Lake City; died July 17; aged 67.

Clarke, Albert W., Carmen, Okla.; died July 15; aged 72.

Crogman, Leon C., Lorain, Ohio; School of Dentistry, Temple University, 1915; died July 27; aged 58.

Dalton, Aubrey H., Braintree, Mass.; died July 17; aged 45.

Daniel, Raymond F., Tampa, Fla.; School of Dentistry, Washington University, 1904; died July 22; aged 65.

Daugherty, Robert W., Nicholasville, Ky.; died July 31; aged 63.

Deeds, Henry A., Plymouth, Ind.; died August 6; aged 93.

Edmunds, Emmett J., Jermyn, Pa.; died in July.

Evans, Frank M., Sardinia, N. Y.; School of Dentistry, University of Buffalo, 1905; died June 1; aged 70.

Eves, Carl, Pine Grove, Pa.; Thomas W. Evans Museum and Dental Institute School of Dentistry, University of Pennsylvania, 1905; died July 30; aged 67.

Fisher, Robert, Metropolis, Ill.; School of Dentistry, St. Louis University, 1914; died July 24; aged 56.

Forrest, Edwin D., Tilton, N. H.; Pennsylvania College of Dental Surgery, 1897; died July 27; aged 81.

France, Foster C., Blackwell, Okla.; School of Dentistry, University of Louisville, 1906; died July 31; aged 70.

Friedmann, Jacob J., Brooklyn; College of Dental and Oral Surgery of New York, 1921; died July 27; aged 49.

Gang, Moses, Jamaica, N. Y.; New York College of Dentistry, 1915; died August 5; aged 53.

Grosch, Charles, Nanuet, N. Y.; New York College of Dentistry, 1890; died July 31; aged 63.

Gutman, Julius, New York; College of Dental and Oral Surgery of New York, 1905; died August 17; aged 61.

Hasert, Emil, San Francisco; died July 13; aged 48.

Haughney, Francis A., New York; Baltimore College of Dental Surgery, 1918; died August 3; aged 58.

Hays, Horace M., San Diego, Calif.; College of Dentistry, University of California, 1903; died July 12; aged 68.

Hendrickson, Frank E., New Egypt, N. J.; Pennsylvania College of Dental Surgery, 1887; died July 17; aged 82.

Hillemeyer, F. H., Carroll, Iowa; Chicago College of Dental Surgery, Dental Department of Loyola University, 1900; died July 6; aged 73.

Ingalls, Lloyd S., Cortland, N. Y.; School of Dentistry, University of Buffalo, 1905; died July 23; aged 52.

Ivins, Lewis T., Cincinnati; Ohio College of Dental Surgery, Dental Department of the University of Cincinnati, 1897; died July 23; aged 79.

Johnson, Elias B., Westwood, N. J.; died July 25; aged 67.

Jones, D. Parson, Jackson, Ohio; Ohio College of Dental Surgery, Dental Department of the University of Cincinnati, 1895; died July 15; aged 73.

Jones, William J., Union City, Tenn.; College of Dentistry, University of Tennessee, 1918; died July 19; aged 53.

Kahn, Harry, Chicago; Chicago College of Dental Surgery, Dental Department of Loyola University, 1917; died August 9; aged 57.

Loomis, E. Fay, Minco, Okla.; died June 18; aged 66.

# DIRECTORY

### Officers

H. B. Washburn, President.....Lowry Bldg., St. Paul
Clyde E. Minges, President-Elect.....Peoples Bank Bldg., Rocky Mount, N. C.
Philip E. Adams, First Vice-President.....106 Marlborough St., Boston
Fred A. Richmond, Second Vice-President.....Huron Bldg., Kansas City, Kan.
A. M. Smith, Jr., Third Vice-President.....Stovall Bldg., Tampa, Fla.
Harold Hillenbrand, Secretary.....222 E. Superior St., Chicago
R. H. Volland, Treasurer.....First National Bank Bldg., Iowa City

### Board of Trustees

LeRoy M. Ennis, 1950, Third District.....4001 Spruce St., Philadelphia
Harold W. Oppice, 1950, Eighth District.....1002 W. Wilson Ave., Chicago
O. H. Moen, 1950, Ninth District.....Watertown, Wis.
Daniel F. Lynch, 1950, Fourth District.....1678 Primrose Road, N. W., Washington, D. C.
J. E. John, Sr., Fifth District.....804 Medical Arts Bldg., Roanoke, Va.
J. B. Carr, 1949, Seventh District.....Hume Mansur Bldg., Indianapolis
C. S. Foster, 1949, Tenth District.....Dows Bldg., Cedar Rapids, Iowa
Robert P. Thomas, 1949, Sixth District.....Francis Bldg., Louisville, Ky.
Henry Hicks, 1949, First District.....5 Glen Court, Greenwich, Conn.
William McGill Burns, 1948, Second District.....80 Hanson Place, Brooklyn
Willard Ogle, 1948, Twelfth District.....Medical Arts Bldg., Dallas, Texas
Fred S. Shandley, 1948, Eleventh District.....Medical & Dental Bldg., Seattle
R. C. Dalgleish, 1948, Thirteenth District.....124 State Capitol, Salt Lake City

### Bureaus

**Chemistry:** Donald A. Wallace, Director, and J. Roy Doty, Senior Chemist, 222 E. Superior St., Chicago.

**Library and Indexing Service:** Josephine P. Hunt, Librarian, and Martha A. Mann, Indexer, 222 E. Superior St., Chicago.

**Public Information:** Herbert B. Bain, Director, 222 E. Superior St., Chicago.

### Section Chairmen

**Dentistry for Children and Oral Hygiene:** Kenneth A. Easlick, University of Michigan, Ann Arbor.

**Full Denture Prosthesis:** W. W. Hurst, 2165 Adelbert Road, Cleveland.

**Histology, Physiology, Pathology, Bacteriology and Chemistry (Research):** Hermann Becks, University of California, San Francisco.

**Hospital Dental Service:** W. Harry Archer, 804 Professional Bldg., Pittsburgh.

**Operative Dentistry, Materia Medica and Therapeutics:** J. Bernard Hutcherson, Starks Bldg., Louisville, Ky.

**Oral Surgery, Exodontia and Anesthesia:** George W. Christiansen, David Whitney Bldg., Detroit.

**Orthodontics:** L. B. Higley, 705 S. Summit St., Iowa City.

**Partial Denture Prosthesis:** Oliver C. Applegate, 216 S. State St., Ann Arbor, Mich.

**Periodontia:** Hunter S. Allen, Comer Bldg., Birmingham, Ala.

**Practice Management:** Gaylord J. James, 9400 Euclid Ave., Cleveland.

**Radiology:** H. C. Fixott, Medical-Dental Bldg., Portland, Ore.

### Standing Committees

**American Red Cross:** George A. Coleman, Chm., 15th and Locust Sts., Philadelphia.

**Constitution and Administrative Bylaws:** Percy T. Phillips, Chm., 18 E. 48th St., New York.

**Dental Education:** Wilbert Jackson, Chm., Clinton, N. D.; Harlan H. Horner, Secy., and Shailer Peterson, Director of Educational Measurements, 222 E. Superior St., Chicago.

**Dental Health:** Hugo M. Kulstad, Chm., First National Bank Bldg., Pomona, Calif.; Allen O. Gruebbel, Secy., 222 E. Superior St., Chicago.

**Dental Legislation:** Carl O. Flagstad, Chm., Medical Arts Bldg., Minneapolis; George H. Fox, Secy., 222 E. Superior St., Chicago.

**Dental Museum:** Henry A. Swanson, Chm., 1726 Eye St., N. W., Washington, D. C.

**Dental Therapeutics:** Thomas J. Hill, Chm., Western Reserve University, Cleveland; Donald A. Wallace, Secy., 222 E. Superior St., Chicago.

**Economics:** Leslie M. FitzGerald, Chm., Roshek Bldg., Dubuque, Iowa; J. E. Bagdonas, Secy., 222 E. Superior St., Chicago.

**History:** Harold L. Faggart, Chm., 2120 Pine St., Philadelphia.

**Insurance:** A. D. Weakley, Chm., 1726 Eye St., N. W., Washington, D. C.; Fred A. Richmond, Secy., Huron Bldg., Kansas City, Kan.

**International Relations:** Stanley D. Tylman, Chm., 185 N. Wabash Ave., Chicago.

**Judicial Council:** Ernest G. Sloman, Chm., 344-14th St., San Francisco.

**Library and Indexing Service:** John E. Gurley, Chm., 350 Post St., San Francisco.

**Membership:** Paul W. Zillmann, Chm., 29 Walden Ave., Buffalo.

**Military Affairs:** Robert T. Curran, Chm., Illinois Bldg., Springfield, Ill.

**Motion Pictures:** Cecil C. Connelly, Chm., 4660 Maryland Ave., St. Louis.

**National Board of Dental Examiners:** W. H. Crawford, Chm., School of Dentistry, University of Minnesota, Minneapolis; Gordon L. Teall, Secy, Hiawatha, Kan.

**Nomenclature:** Harry Lyons, Chm., Professional Bldg., Richmond, Va.

**Patents and Honorary Awards:** M. D. K. Bremner, Chm., 173 W. Madison St., Chicago.

**Prosthetic Dental Service:** F. W. Herbine, Chm., 230 Fifth St., Reading, Pa.

**Relief:** Thomas R. Cullen, Chm., 189 W. First St., Oswego, N. Y.; L. H. Jacob, Secy., Jefferson Bldg., Peoria, Ill.

**Research:** M. D. Huff, Chm., Medical Arts Bldg., Atlanta, Ga.; Charles B. Hall, Secy., 1825 Eye St., N. W., Washington, D. C.

**Scientific and Health Exhibits:** Leo F. Marré, Chm., Paul Brown Bldg., St. Louis.

THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION
222 East Superior Street, Chicago 11, Illinois
WHItehall 6730 Cable Address: ADAECO

**Lon W. Morrey, Editor** **John J. Hollister, Business Manager**

All expressions of opinions and all statements of supposed facts are published on the authority of the writer over whose signature they appear, and are not to be regarded as expressing the views of the American Dental Association, unless such statements or opinions have been adopted by the Association. *Articles* are accepted with the understanding that they have not been published previously and that they are submitted solely to THE JOURNAL. *Advertising:* All products coming within the scope of the Council on Dental Therapeutics of the American Dental Association must be acceptable to the Council in order to be advertised in THE JOURNAL. Subscription is included in the annual membership dues of the American Dental Association. The subscription rate is $7 a year payable in advance for domestic subscriptions and $8 a year for foreign subscriptions. *Notice of change of address* should be received one month before the change is to be effective.

# ANNOUNCEMENTS

## MEETINGS OF STATE SOCIETIES

| State | Date | Place | Secretary | Address |
|---|---|---|---|---|
| Alabama | April 15–17, 1948 | Birmingham | G. W. Matthews | 1922 Tenth Ave., S. Birmingham 5 |
| Arizona | | | B. K. Litt | 68 E. Congress, Tucson |
| Arkansas | | | I. M. Sternberg | Merchants Bank Bldg., Ft. Smith |
| California | | | L. E. Linehan | 450 Sutter St., San Francisco |
| S. California | | | M. E. Ralston | 903 Crenshaw Bldg., Los Angeles 6 |
| Colorado | | | R. A. Downs | 724 Republic Bldg., Denver 2 |
| Connecticut | | | E. S. Arnold | 37 Linnard Rd., W. Hartford |
| Delaware | | | J. Krygier | 309 S. State St., Dover |
| D. of Columbia | | | K. H. Wood | 202-1835 Eye St., N.W. Washington |
| Florida | Nov. 10–12 | St. Petersburg | J. I. Todd | 433 St. James Bldg., Jacksonville |
| Georgia | Oct. 19–22 | Atlanta | J. M. Heard, Jr. | Persons Bldg., Macon |
| Hawaii | Oct. 30–Nov. 1 | Honolulu | J. H. Dawe | P. O. Box 39, Honolulu 10 |
| Idaho | | | R. Sutcliff | Twin Falls |
| Illinois | Oct. 9–11 | Peoria | P. W. Clopper | 623 Jefferson Bldg., Peoria 2 |
| Indiana | | | E. E. Ewbank | Kingman |
| Iowa | | | A. N. Humiston | 417 Higley Bldg., Cedar Rapids |
| Kansas | | | F. A. Richmond | 1008 Huron Bldg., Kansas City |
| Kentucky | | | J. L. Walker | 640 Barbee Way, S. Louisville |
| Louisiana | April 8–10, 1948 | Alexandria | J. S. Bernhard | 407 Medical Arts Bldg., Shreveport |
| Maine | | | A. H. Garcelon | State House, Augusta |
| Maryland | May 3–5, 1948 | Baltimore | J. H. Shackelford | 706 Baltimore Life Bldg., Baltimore 1 |
| Massachusetts | May 3–6, 1948 | Boston | P. E. Adams | 227 Commonwealth Ave. Boston 16 |
| Michigan | April 12–14, 1948 | Detroit | F. Wertheimer | Michigan Department of Health, Lansing |
| Minnesota | Feb. 23–25, 1948 | St. Paul | L. M. Cruttenden | Lowry Medical Arts Bldg., St. Paul |
| Mississippi | | | F. C. Sneed | Osyka |
| Missouri | April 26–28, 1948 | Jefferson City | C. W. Digges | Exchange National Bank Bldg., Columbia |
| Montana | | | C. S. Renouard | 305 Phoenix Bldg., Butte |
| Nebraska | | | F. A. Pierson | Federal Securities Bldg., Lincoln |
| Nevada | | | L. G. Jacob | 505 Chestnut St., Reno |
| New Hampshire | | | F. E. Williams | 814 Elm St., Manchester |
| New Jersey | April 20–23, 1948 | Atlantic City | J. G. Carr | 407 Cooper St., Camden |
| New Mexico | | | J. S. Eilar | First National Bank Bldg., Albuquerque |
| New York | May 10–13, 1948 | Syracuse | C. A. Wilkie | 1 Hanson Place, Brooklyn |
| North Carolina | April 26–28, 1948 | Asheville | C. W. Sanders | Benson |
| North Dakota | | | K. G. Allen | Fargo |
| Ohio | Nov. 9–12 | Cleveland | E. G. Jones | 185 E. State St., Columbus |
| Oklahoma | | | E. W. Wise | Medical Arts Bldg., Tulsa |
| Oregon | | | W. H. Hurley | 922 Selling Bldg., Portland 5 |
| Panama Canal Z. | | | T. W. Cagle | Box 243, Cocoli |
| Pennsylvania | May 11–13, 1948 | Atlantic City, N. J. | E. R. Aston | 421 Market St., Kingston |
| Philippine I. | | | G. A. Carreon | 9 Broadway, Third St., N. Manila |
| Puerto Rico | | | R. Miranda | Box 747, Rio Piedras |
| Rhode Island | | | S. Ozarin | 172 Thames St., Newport |
| South Carolina | | | J. R. Owings | 201 E. North St., Greenville |
| South Dakota | May 9–11, 1948 | Sioux Falls | E. W. Elmen | Sioux Falls |
| Tennessee | May 24–27, 1948 | Memphis | E. J. Justis | Exchange Bldg., Memphis |
| Texas | April 12–15, 1948 | Fort Worth | W. Ogle | 313 Medical Arts Bldg., Dallas |
| Utah | | | S. Ballinger | 1001 Tribune-Telegram Bldg., Salt Lake City |
| Vermont | | | J. A. Larrow | Middlebury |
| Virginia | | | J. E. John | 804 Medical Arts Bldg. Roanoke |
| Washington | Jan. 29–31, 1948 | Seattle | F. J. Dingler | 1502 Medical & Dental Bldg., Seattle 1 |
| West Virginia | July 5–7, 1948 | White Sulphur Springs | C. J. Gavelda | Clarksburg |
| Wisconsin | March 30–April 1, 1948 | Milwaukee | R. A. Mason | 964 N. 27th St., Milwaukee |
| Wyoming | | | J. D. McNiff | 208 Grand Ave., Laramie |

## MEETINGS OF STATE BOARDS OF DENTAL EXAMINERS

| State | Date | Place | Secretary | Address |
|---|---|---|---|---|
| Arizona | Oct. 1–4 | | R. K. Trueblood | 25 N. Second Ave., Glendale |
| Connecticut | Nov. 18–22 | Hartford | C. G. Brooks | 302 State St., New London |
| Indiana | Nov. 3–6 | Indianapolis | C. A. Frech | Gary National Bank Bldg., Gary |
| Minnesota | Jan. 5, 1948 | | E. E. Comartin | 100 First Avenue Bldg., Rochester |
| Ohio | Oct. 13–18 | Columbus | E. D. Lowry | 79 E. State St., Columbus |
| Wisconsin | Feb. 9–13, 1948 | Milwaukee | S. F. Donovan | Tomah |

## OTHER MEETINGS

| Name | Date | City | Secy. or Chm. | Address |
|---|---|---|---|---|
| American Academy of Applied Nutrition, Twelfth Annual Meeting | Oct. 4–5 | Del Mar, Calif. | A. G. James Secy. | 409 N. Camden Drive, Beverly Hills, Calif. |
| American Academy of Dental Medicine, Luncheon and Round Table Discussion | Dec. 7 | New York | W. M. Greenhut Secy. | 124 E. 84th St., New York 28 |
| American Anti-Arthritis Association | Oct. 4–5 | Del Mar, Calif. | R. T. Pottenger Secy. | Monrovia, Calif. |
| American Board of Oral Surgery | Nov. 7–8* | Chicago | L. M. FitzGerald Secy. | 718 Roshek Bldg., Dubuque, Iowa |
| American Dental Society of Europe | July 27–30, 1948 | London | K. C. Campbell Secy | 88 Portland Place, London, W. 1. |
| American Public Health Association, Seventy-Fifth Annual Meeting | Oct. 6 | Atlantic City, N. J. | R. M. Atwater Secy. | 1790 Broadway, New York 19 |
| American Society for the Advancement of General Anesthesia in Dentistry | Oct. 27 | New York | M. H. Feldman Secy. | 730 Fifth Ave., New York |
| National Board of Dental Examiners | Dec. 1–2† | | G. L. Teall Secy. | Box 71, Hiawatha, Kan. |
| Federacion Odontologica Latino Americana, Fifth Congress | Oct. 3 | Buenos Aires | D. M. Cohen Secy. | Calle Junin No. 959, Buenos Aires, Argentina |
| Annual Seminar for the Study and Practice of Dental Medicine | Oct. 19–24 | Yosemite Valley, Calif. | M. G. Lewis Secy. | 1618 Ninth Ave., San Francisco 22 |
| Montreal Dental Club, Twenty-Third Annual Fall Clinic | Oct. 22–24 | Montreal | M. L. Donigan Director | Drummond Medical Bldg., 1414 Drummond St., Montreal 2, Canada |
| Denver Dental Association, Forty-First Annual Mid-Winter Meeting | Jan. 11–14, 1948 | Denver | K. F. Grove Chm. | 1325 E. 16th Ave., Denver |
| Indiana University Dental Alumni Association Meeting | Oct. 3–4 | Bloomington | J. W. Geller Pres. | 704 Bankers Trust Bldg., Indianapolis 4 |
| New England Dental Society | Nov. 5–6 | Boston | J. F. Barton Secy. | 43 Farmington Ave., Hartford 5, Conn. |
| Midcontinent Dental Congress, Seventh Annual Meeting | Dec. 1–3 | St. Louis | V. H. Frederich Secy. | Arcade Bldg., St. Louis |
| University of Buffalo, School of Dentistry Alumni Association, Forty-Fifth Annual Meeting | Oct. 14–16 | Buffalo | E. L. Ruffing Publicity Chm. | 233 W. Ferry St., Buffalo 13 |
| Dental Hygienists Association of the City of New York | Oct. 3 | New York | L. Nordstrom Publicity Chm. | 80 Hanson Place, Brooklyn |
| Greater New York Dental Meeting | Dec. 8–12 | New York | K. N. Donally Publicity Chm. | Room 106A, Hotel Pennsylvania, New York |
| New York Academy of Medicine, Twentieth Graduate Fortnight | Oct. 6–17 | New York | I. Galdston Secy. | 2 E. 103rd St., New York 29 |
| Northeastern Society of Orthodontists | Nov. 10–11 | New York | O. Jacobson Secy. | 35 W. 81st St., New York |
| Odontological Society of Western Pennsylvania, Sixty-Sixth Annual Meeting | Oct. 28–30 | Pittsburgh | W. E. Craig Secy. | Jenkins Bldg., Pittsburgh 22 |

*Examinations for certification.

†Examinations will be held in schools where there are five or more candidates.

## INTERNSHIPS, EXTERNSHIPS, RESIDENCIES AND FELLOWSHIPS

**Boston City Hospital,** Boston. Oral Surgeon-in-Chief, Stephen P. Mallett.

**The Children's and Infants' Hospital (a Unit) of Boston.** Address Paul K. Losch, 300 Longwood Ave., Boston

**The Children's Memorial Hospital,** Chicago. Administrator, Mabel W. Binner, 707 Fullerton Ave., Chicago.

**City Memorial Hospital,** Winston-Salem, N. C. Superintendent, J. B. Whittington.

**Columbia University, School of Dental and Oral Surgery.** Associate Dean, Bion R. East, 630 W. 168th St. New York 32.

**Delaware Hospital, Inc.,** Wilmington. Medical Director, Delaware Hospital, 501 W. Fourteenth St., Wilmington 13

**Eastman Dental Dispensary,** Rochester, N. Y.

**Fellowships for Research and Graduate Work in the Dental Sciences,** University of Rochester. Dean, George H. Whipple.

**The Forsyth Dental Infirmary for Children.** Director, Percy R. Howe, 140 The Fenway, Boston.

**International Grenfell Association.** Staff Selection Committee, 156 Fifth Ave., New York.

**Jewish Sanitarium and Hospital for Chronic Diseases.** Director, Leonard Kohn, Dental Division, E. Forty-Ninth St. and Rutland Road, Brooklyn 3, N. Y.

**Joseph Samuels Dental Clinic of the Rhode Island Hospital,** Providence.

**New York Foundling,** New York. Medical Director, Alfred J. Vignec, 175 E. Sixty-Eighth St., New York.

**Notre Dame Bay Memorial Hospital,** Twillingate, Newfoundland. Address John M. Konopka, 25 W. Independence St., Shamokin, Pa.

**Richmond Freeman Memorial Clinic for Infants and Children,** Dallas, Texas. Executive Director, Dora B Foster, 3617 Maple Ave., Dallas.

**University of California, College of Dentistry,** San Francisco. Dean W. C. Fleming, University of California, Medical Center, San Francisco.

**University of Illinois, Graduate School.** Fellowships for Research and Graduate Work. Secretary, Committee on Graduate Work in Medicine, Dentistry and Pharmacy, 1853 W. Polk St., Chicago 12.

**University of Illinois, Research and Educational Hospital,** Chicago. Supervisor of Hospital Dental Services, Maury Massler, University of Illinois, 808 S. Wood St., Chicago 12.

**University of Oregon, Medical School and Hospitals,** Portland. Administrator, Charles N. Holman, 3181 S. W Marquam Hill Road, Portland.

**Walter G. Zoller Memorial Dental Clinic,** University of Chicago. Director, J. R. Blayney, 950 E. Fifty-Ninth St. Chicago 37.